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Consultations with health care providers and use of self-management strategies for prevention and treatment of COVID-19 related symptoms. A population based cross-sectional study in Norway, Sweden and the Netherlands

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ABSTRACT

Objectives: The present study was initiated to determine consultations with health care providers and use of self-management strategies for prevention or treatment of COVID-19 related symptoms in countries with a full lockdown (Norway), a partial lockdown (the Netherlands) and no lockdown (Sweden) during the first three months of the COVID-19 pandemic, and if such use correlates with worries of being infected by COVID-19 disease.

Design: Data were collected in collaboration with Ipsos A/S in April-June 2020. An adapted version of the International Questionnaire to measure use of Complementary and Alternative Medicine (I-CAM-Q) was used with the categories “for prevention of COVID-19” and “to treat COVID-19-related symptoms” added. Data were collected among a representative sample in Norway, Sweden and the Netherlands using data assisted telephone interviews (Norway, n=990 and Sweden, n=500), and an online survey (the Netherlands, n=1004). Total response rate was 30%.

Results: Very few consulted a health care provider with the intention to treat or prevent COVID-19 (1.2% and 1.0% respectively) with medical doctors mostly visited (1.0% and 0.9% respectively). Similarly, the use of self-management strategies to prevent or treat COVID-19 was low (3.4% and 0.2% respectively); most commonly used for prevention of COVID-19 were vitamins and minerals (2.8%). Consultations with health care providers and use of self-management strategies for prevention of COVID-19 were positively associated with worries of being infected with COVID-19.

Conclusions: The COVID-19 pandemic does not seem to have evoked a large-scale difference in behavior related to consultations with health care providers or the use of self-management strategies in any of the three countries.

Abbreviations: COVID-19, Coronavirus Disease 2019; TCM, Traditional Chinese Medicine; NAFKAM, National Research Center in Complementary and Alternative Medicine; WHO, World Health Organization; I-CAM-Q, International Questionnaire to measure use of Complementary and Alternative Medicine; NOK, Norwegian kroner; SEK, Swedish kroner; EUR, Euro; SD, Standard Deviation.

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1. Introduction

During the first wave of the COVID-19 pandemic countries have implemented control measures that include different combinations of containment and mitigation measures. In Norway, a nationwide lockdown was implemented on March 12, 2020,¹ based on a rhetoric that appealed to citizens' own responsibility, voluntary working and herd mentality.² The lockdown included closure of kindergartens, schools and restaurants. Citizens were instructed to work from home, to minimize the use of public transport, refrain from nonessential traveling, and borders were closed to travelers from outside Norway.

In Sweden, there was no lockdown of society comparable to other European countries. Most pre-schools and schools, except high-schools, were kept open but with restrictions. Universities re-directed all education to web-based resources and people were asked to work from home wherever possible. A general recommendation to keep a 2-meter interpersonal distance was re-iterated in public announcements and home isolation was recommended to all persons with cold- or influenza-like symptoms and to people in risk-groups such as people aged 70 or more. Restaurants, bars, and shops remained open with certain capacity limits. The strategy was described by authorities as aimed at minimizing mortality and morbidity in the entire population and at the same time minimizing other negative consequences for individuals and society.³

In the Netherlands, the first control measures were enforced on March 15, 2020, and led to a partial, so-called 'intelligent' lockdown of the country.⁴ The Dutch Government aimed to appeal to citizens' own responsibility and self-discipline to stay at home as much as possible, to practice 1.5 meters interpersonal distance, take hygiene measurements and to maintain home isolation after being in contact with someone who was tested positive or when showing cold- or influenza-like symptoms. However, additional measures enforced by law were introduced over the course of several weeks in March and April 2020. These measures included closure of schools, restaurants, certain beaches and parks, and prohibition of spontaneous gathering of people in public areas.

The country-specific containment and mitigation measures during the COVID-19 pandemic have strongly affected citizens' daily lives. A large international study demonstrated that COVID-19 home confinement negatively affects physical activity intensity levels and lead to a more unhealthy food consumption.⁵ Furthermore, it has been reported that general mental health has deteriorated during the pandemic,⁶ and fear, panic, anxiety, and xenophobia has increased.⁷ Authorities and health care professionals' recommendations for staying healthy during the pandemic are mainly related to healthy lifestyle measures such as ensuring sufficient sleep, eating fresh fruits and vegetables, reducing stress and social isolation, staying active and taking appropriate hygiene measures.⁸

Several reports have appeared in the media stating that people are looking for self-management strategies to prevent COVID-19 infection or to treat possible COVID-19 infection-related symptoms.⁹ The look for such strategies has shown to increase with stress and/or high levels of anxiety.¹⁰ Examples of claims circulating on the Internet include that high doses of vitamin C¹¹ can prevent COVID-19, and antiviral-essential oils (e.g. oregano), or diet modifications are effective against the coronavirus.¹² Several papers have appeared in the scientific literature claiming that Traditional Chinese Medicine (TCM) may be effective in the treatment of COVID-19.^{11,13} Furthermore, the World Health Organization (WHO) encouraged studies on the efficacy and safety of traditional medicinal plants such as Artemisia for the treatment of COVID-19.¹⁴ Although the effectiveness of high-dose vitamin C in the treatment of COVID-19-related pneumonia is currently being investigated,¹⁵ to date, there is no scientific evidence that vitamin C or any other dietary supplement can prevent or cure COVID-19.¹⁶ It is therefore of great importance to investigate people's consultations with health care providers and use of self-management strategies during the COVID-19 pandemic. This will provide valuable insights for health care professionals, authorities and scientists in order to guide future

communication and research, and to support rational decision-making in pandemic times.

2. Aims

The present study was initiated to determine the prevalence of consultations with health care providers and use of self-management strategies such as herbal remedies, dietary supplements and self-help techniques for prevention and treatment of COVID-19 related symptoms in countries with a full lockdown (Norway), a partial ('intelligent') lockdown (the Netherlands) and no lockdown (Sweden) during the first three months of the COVID-19 pandemic, and to explore if such use correlates with worries of being infected by COVID-19.

3. Methods

Data were collected in April-June 2020 during the first wave of the COVID-19 pandemic on the initiative of the National Research Center in Complementary and Alternative Medicine (NAFKAM) in Norway. Although we strived for similar samples and sampling methods in all three countries, different prerequisites in time and resources resulted in methodological differences as described below.

3.1. Data collection in Norway

A national survey based on computer-assisted telephone interviews was conducted between April 28 and May 5, 2020 in collaboration with the marketing research company Ipsos Norway. The target sample size was 1,000 people out of a total population of 5.4 million.¹⁷ The sample was drawn from Norwegian residents aged 18 and above living in private households with a landline telephone or a cell phone using random quota sampling. Quotas by age, sex, and region of residence were established to obtain a sample representative of the adult population of Norway. When calling a landline number, the interviewer asked for the person in the household who was 18 years of age or older with the most recent birthday. When calling a cell phone number, the person answering the phone was interviewed directly. Up to 7 attempts were made to reach the selected person. N=4,337 were unreachable after 7 calling attempts. Individuals who were reached and refused participation (n=1,881) were considered non-respondents, leading to a response rate of 34.5%. The final sample contained 990 individuals (Fig. 1), 55 recruited on the basis of landline numbers and 935 on the basis of cell phone numbers.

3.2. Data collection in Sweden

In Sweden, the data collection was conducted in the same way as in Norway between June 15 and June 23, 2020 in collaboration with Ipsos Sweden. In Sweden the target sample size was 500 people representing the total population of 10.1 million inhabitants.¹⁷ As in Norway up to seven attempts were made to reach the selected person. N=5,571 were unreachable after seven calling attempts. Individuals who were reached and refused participation (n=429) were considered non-respondents, leading to a response rate of 53.8%. The final sample contained 500 individuals (Fig. 1), 68 recruited on the basis of landline numbers and 432 on the basis of cell phone numbers.

3.3. Data collection in the Netherlands

In the Netherlands, an online survey was performed between May 18 and May 22, 2020 in collaboration with Ipsos Netherlands. From a panel of 45,000 Dutch residents (representing a total population of 17.1 million¹⁷), a representative sample was invited to complete the questionnaire until 1,000 responses were received. Individuals who were reached and refused participation (n=3,607) were considered non-respondents, leading to a response rate of 22%. The final sample

contained 1,004 individuals (Fig. 1).

3.4. Survey instrument

A modified version of the International Questionnaire to measure use of Complementary and Alternative Medicine (I-CAM-Q) instrument¹⁸ was used with the categories “for prevention of COVID-19” and “to treat COVID-19-related symptoms” added to the reasons for use options. The questionnaire included questions about consultations with health care providers (see Table 2 for complete list of providers) and self-management strategies such as use of natural remedies (see Table 3 for complete list of natural remedies), and self-help techniques (see Table 4 for complete list of self-help techniques) used within the last three months. The questions regarding specific therapies were adapted to the different countries studied (see Tables 2–4 for complete list of modalities asked for in each country).

Other data collected were gender, region of residence, age, household income, and highest completed level of education. In addition, three questions regarding the respondents’ views on COVID-19 were added (see further below).

4. Measures

4.1. Measures of personal characteristics

Yearly household income was categorized as low (<NOK400,000 in

Norway, <SEK300,000 in Sweden, and <EUR 25,000 in the Netherlands), middle (NOK 400,000-799,000 in Norway, SEK 300,000-599,000 in Sweden, and EUR 25,000 – 74,999 in the Netherlands), or high (≥ NOK 800,000 in Norway, ≥ SEK 600,000 in Sweden, and ≥ EUR 75,000 in the Netherlands).

Level of education was grouped in three categories: 1. primary school; 2. secondary school; and 3. college/university. The following values were collapsed into these three categories a) Norway: 1. primary school up to 8 years; 2. secondary school; 3. college/university less than 4 years; and 3. college/university 4 years or more, b) Sweden: 1. primary school; 2. secondary school; 3. college/university less than 4 years; and 3. college/university 4 years or more, and c) the Netherlands: 1. primary school only; 1. lower secondary school; 2. middle and higher secondary education; and 3. higher education (applied) university/ post-doctoral level.

Age was obtained as an open question and either assessed as a continuous variable, or as three categories (18-29 years; 30-59 years; and 60 years or over).

4.2. Worries about becoming infected

Since attitudes about COVID-19 might influence people’s health care behaviors, three questions related to COVID-19 were asked.

On a scale from 1-5, where 1 is the lowest and 5 the highest: 1) How worried are you of becoming infected with the virus causing COVID-19 disease?, 2) How worried are you that some of your friends and family

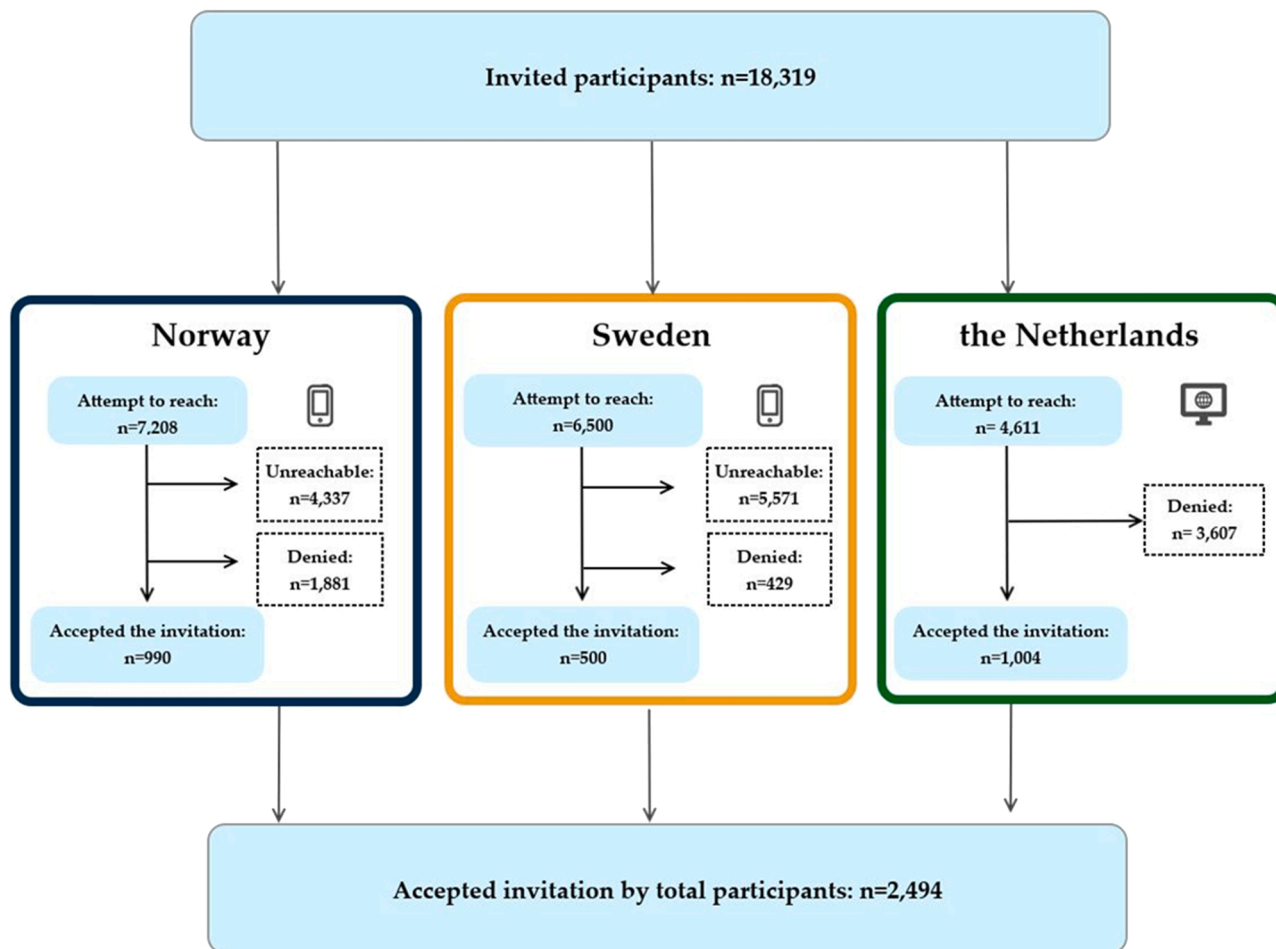


Fig. 1. Flowchart of the respondents in the survey.

Table 1
Basic characteristics of the respondents.

	Total		Norway		Sweden		The Netherlands		p-value*
	%	(n=2,494)	%	(n=990)	%	(n=500)	%	(n=1,004)	
Gender									
Men	50.3	(1255)	51.9	(514)	49.2	(246)	49.3	(495)	0.432
Women	49.7	(1239)	48.1	(476)	50.8	(254)	50.7	(509)	
Age									
Mean age (SD)	48.19	(18.262)	46.98	(18.403)	49.25	(20.176)	48.85	(17.030)	<0.001
18-29 years	20.3	(507)	22.7	(225)	21.2	(106)	17.5	(176)	0.003
30-59 years	49.2	(1227)	50.5	(500)	45.6	(228)	49.7	(499)	
≥ 60 years	30.5	(760)	26.8	(265)	33.2	(166)	32.8	(329)	
Household income^a									<0.001
Low	18.0	(349)	13.3	(105)	18.8	(94)	14.9	(150)	<0.001
Middle	45.7	(887)	33.8	(268)	24.0	(120)	49.7	(499)	
High	36.4	(707)	52.9	(419)	28.4	(142)	14.5	(146)	
Do not want to answer	11.8	(294)	6.2	(61)	4.8	(24)	20.8	(209)	
Do not know	10.3	(257)	13.8	(137)	24.0	(120)	0.0	(0)	
Years of Education									<0.001
Primary school	13.0	(325)	9.5	(94)	12.8	(64)	16.6	(167)	<0.001
Secondary school	36.1	(901)	36.1	(357)	41.6	(208)	33.5	(336)	
College/university	50.8	(1268)	54.4	(539)	45.6	(228)	49.9	(501)	

* Pearson chi-square test.

^a Low (<NOK400,000 in Norway, <SEK300,000 in Sweden, and <EUR 25,000 in the Netherlands), middle (NOK 400,000–799,000 in Norway, SEK 300,000–599,000 in Sweden, and EUR 25,000–74,999 in the Netherlands), and high (≥ NOK 800,000 in Norway, ≥ SEK 600,000 in Sweden, and ≥ EUR 75,000 in the Netherlands).

Table 2
Consultations with health care providers during the first three months of the COVID-19 pandemic.

	Total (n=2,494)			Norway (n=990)			Sweden (n=500)			The Netherlands (n=1,004)		
	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat
	%* (n)	C19 %* (n)	C19 %* (n)	% (n)	C19 % (n)	C19 % (n)	% (n)	C19 % (n)	C19 % (n)	% (n)	C19 % (n)	C19 % (n)
Consultations with health care providers	45.1	1.2 (29)	1.0	51.2	1.7 (17)	1.1	42.8	1.6 (8)	1.0 (5)	40.3	0.6 (6)	1.0
Medical doctor	36.8	0.9 (22)	1.0	44.2	1.6 (16)	1.1	32.6	1.0 (5)	1.0 (5)	31.6	0.1 (1)	1.0
Massage therapist	4.9 (122)	0.04 (1)	0	3.0 (30)	0	0	6.2 (31)	0	0	6.1 (61)	0.1 (1)	0
Chiropractor	2.9 (72)	0	0	3.8 (38)	0	0	1.6 (8)	0	0	2.6 (26)	0	0
Psychotherapist	1.8 (27)	0	0	1.3 (13)	0	0	2.8 (14)	0	0	-	-	-
Naprapath	1.7 (25)	0.07 (1)	0	1.5 (15)	0	0	2.0 (10)	0.2 (1)	0	-	-	-
Acupuncturist	1.4 (36)	0.04 (1)	0	1.2 (12)	0	0	1.4 (7)	0	0	1.7 (17)	0.1 (1)	0
Naturopath	1.3 (13)	0	0	-	-	-	-	-	-	1.3 (13)	0	0
Coach	0.9 (13)	0	0	0.8 (8)	0	0	1.0 (5)	0	0	-	-	-
Reflexologist	0.7 (18)	0.08 (2)	0	1.0 (10)	0	0	0.2 (1)	0	0	0.7 (7)	0.2 (2)	0
Nutritionist	0.6 (3)	0	0	-	-	-	0.6 (3)	0	0	-	-	-
Healer	0.6 (16)	0	0	0.5 (5)	0	0	0.4 (2)	0	0	0	0.9 (9)	0
Homeopath	0.6 (16)	0.04 (1)	0	0.1 (1)	0	0	0.2 (1)	0	0	1.4 (14)	0.1 (1)	0
Cupping therapist	0.4 (4)	0	0	0.4 (4)	0	0	-	-	-	-	-	-
Herbalist	0.4 (4)	0	0	0.4 (4)	0	0	-	-	-	-	-	-
Anthroposophic care giver	0.3 (5)	0	0	-	-	-	0	0	0	0.5 (5)	0	0
Traditional healer	0.3 (3)	0.1 (1)	0	0.3 (3)	0.1 (1)	0	-	-	-	-	-	-
Traditional Chinese Medicine (TCM) provider	0.2 (3)	0	0	-	-	-	0.2 (1)	0	0	0.2 (2)	0	0
Osteopath	0.1 (25)	0	0	0.8 (8)	0	0	0.4 (2)	0	0	1.5 (15)	0	0
Kinesiologist	0.07 (1)	0	0	0.1 (1)	0	0	0	0	0	-	-	-
Other health care providers	5.6 (140)	0.4 (1)	0	5.4 (53)	0.1 (1)	0	7.0 (35)	0.4 (2)	0	4.8 (48)	0	0

- Not asked; * Percentage calculated from respondents asked about each therapy

could become infected with the virus causing COVID-19 disease, and 3) COVID-19 is more dangerous than ordinary influenza. The continuous variables 1-5 were in the analyses merged into three categorical variables: Not (1 and 2), somewhat (3), and very (4 and 5).

4.3. Statistics/ power calculation

In order to generalize from a random sample and avoid sampling errors or biases, a random sample needs to be of adequate size.¹⁹ With a margin of error of 5%, a confidence level of 95%, and a heterogeneity of 50%, we needed a minimum sample of n=384 to represent the

Norwegian population of 5.4 million inhabitants, n=384 to represent the Swedish population of 10.1 million, and n=384 to represent the Dutch population of 17.1 million inhabitants for adequate study power.²⁰ As increased sample size is associated with decreased sampling error and is more likely to represent the population,²¹ the sample size was set to n=1000 in Norway, n=500 in Sweden, and n=1000 in the Netherlands.

Data were presented descriptively as frequencies (% and actual number of participants (n)) for nominal data and as means and standard deviation (SD) for summarized data. Statistical testing (inference statistics) was performed by Pearson chi-square tests for ordinal data and

Table 3

Use of natural remedies, vitamins, minerals and dietary supplements during the first three months of the COVID-19 pandemic.

	Total (n=2,494)			Norway (n=990)			Sweden (n=500)			The Netherlands (n=1004)		
	Total	Prevent C19	Treat C19	Total	Prevent C19	Treat C19	Total	Prevent C19	Treat C19	Total	Prevent C19	Treat C19
	%* (n)	%* (n)	%* (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Use of natural remedies, vitamins, minerals and dietary supplements	62.8 (1567)	3.4 (85)	0.24 (6)	72.8 (721)	1.7 (17)	0.2 (2)	50.0 (250)	3.8 (19)	0.4 (2)	59.4 (596)	4.9 (49)	0.2 (2)
Use of herbs	18.2 (455)	0.7 (18)	0.1 (3)	15.2 (150)	0.5 (5)	0	22.8 (114)	1.2 (6)	0.2 (1)	19.0 (191)	0.7 (7)	0.2 (2)
Ginger	6.8 (102)	0.3 (4)	0.07 (1)	5.1 (50)	0.2 (2)	0	10.4 (52)	0.4 (2)	0.2 (1)	-	-	-
Curcumin	5.8 (145)	0.1 (1)	0	3.2 (32)	0	0	6.4 (32)	0.2 (1)	0	8.1 (81)	0	0
Garlic	4.2 (63)	0.3 (4)	0.1 (1)	4.0 (40)	0.2 (2)	0	4.6 (23)	0.4 (2)	0.2 (1)	-	-	-
Green tea	4.0 (60)	0.1 (2)	0	3.9 (39)	0.1 (1)	0	4.2 (21)	0.2 (1)	0	-	-	-
Herbal tea	4.0 (59)	0.1 (1)	0	4.2 (42)	0.1 (1)	0	3.4 (17)	0	0	-	-	-
Cranberry	3.9 (99)	0.1 (2)	0	2.6 (26)	0.2 (2)	0	2.8 (14)	0	0	5.9 (59)	0	0
Blueberry / blueberry extract	3.5 (55)	0.1 (1)	0	3.0 (30)	0.1 (1)	0	4.4 (22)	0	0	-	-	-
Oregano	2.6 (39)	0	0	2.6 (26)	0	0	2.6 (13)	0	0	-	-	-
Echinacea	2.1 (53)	0.2 (4)	0	0.5 (5)	0	0	1.0 (5)	0	0	4.3 (43)	0.4 (4)	0
Aloe Vera	2.0 (10)	0.2 (1)	0	-	-	-	2.0 (10)	0.2 (1)	0	-	-	-
Ginseng	1.8 (27)	0.16 (1)	0	-	-	-	1.0 (5)	0	0	2.2 (22)	0.1 (1)	0
Red Yeast rice (xuezhikang)	1.8 (18)	0	0	-	-	-	-	-	-	1.8 (18)	0	0
Rhodiola rosea	1.0 (5)	0	0	-	-	-	1.0 (5)	0	0	-	-	-
Passiflora	0.7 (7)	0	0	-	-	-	-	-	-	0.7 (7)	0	0
Ginkgo biloba	0.6 (6)	0	0.1 (1)	-	-	-	-	-	-	0.6 (6)	0	0.1 (1)
Indian Ginseng	0.5 (5)	0	0	-	-	-	-	-	-	0.5 (5)	0	0
Actaea racemosa (black cohosh)	0.5 (5)	0	0	-	-	-	-	-	-	0.5 (5)	0	0
Chaga	0.3 (3)	0	0	0.3 (3)	0	0	-	-	-	-	-	-
Lady's thistle	0.2 (2)	0	0	-	-	-	-	-	-	0.2 (2)	0	0
Other herbs	3.1 (31)	0.2 (2)	0.1 (1)	2.2 (22)	0	0	7.6 (38)	0.8 (4)	0.2 (1)	3.1 (31)	0.2 (2)	0.1 (1)
Use of vitamins and minerals	49.9 (1245)	2.8 (69)	0.2 (4)	51.0 (505)	1.2 (12)	0	37.6 (188)	3.2 (16)	0.4 (2)	55.0 (552)	4.1 (41)	0.2 (2)
Vitamin D	21.2 (527)	0.9 (22)	0.1 (2)	22.8 (226)	0.4 (4)	0	13.0 (65)	1.8 (9)	0.4 (2)	23.5 (236)	0.9 (9)	0
Multivitamins	17.5 (436)	0.5 (12)	0	18.3 (181)	0.4 (4)	0	12.6 (63)	0.8 (4)	0	19.1 (192)	0.4 (4)	0
Vitamin C	15.7 (390)	1.7 (43)	0.1 (3)	16.2 (160)	0.9 (9)	0	11.0 (55)	1.4 (7)	0.2 (1)	17.4 (175)	2.7 (27)	0.2 (2)
Magnesium	11.4 (284)	0.4 (9)	0.04 (1)	11.0 (109)	0.3 (3)	0	9.8 (49)	0.4 (2)	0.2 (1)	12.5 (126)	0.4 (4)	0
Vitamin B	7.8 (195)	0.2 (5)	0	8.1 (80)	0.3 (3)	0	6.8 (34)	0	0	8.1 (81)	0.2 (2)	0
Calcium	4.7 (117)	0.1 (3)	0	5.4 (53)	0.2 (2)	0	3.0 (15)	0	0	4.9 (49)	0.1 (1)	0
Iron	4.2 (104)	0.1 (2)	0	5.5 (54)	0.1 (1)	0	4.0 (20)	0	0	3.0 (30)	0.1 (1)	0
Zinc	2.7 (67)	0.3 (7)	0.04 (1)	2.5 (25)	0.2 (2)	0	4.0 (20)	0.4 (2)	0.2 (1)	2.2 (22)	0.3 (3)	0
Selenium	1.1 (27)	0.04 (1)	0	1.7 (17)	0.1 (1)	0	0.8 (4)	0	0	0.6 (6)	0	0
Other vitamins and minerals	5.3 (132)	0.04 (1)	0.1 (2)	4.5 (45)	0	0	5.8 (29)	0.2 (1)	0.2 (1)	5.8 (58)	0	0.1 (1)
Homeopathic remedies	4.7 (118)	0.2 (4)	0	1.3 (13)	0	0	0.6 (3)	0	0	10.2 (102)	0.4 (4)	0
Bach flower remedies	2.3 (45)	0.3 (5)	0	0.4 (4)	0	0	-	-	-	4.1 (41)	0.5 (5)	0
Use of dietary supplements	29.2 (729)	0.4 (9)	0.1 (2)	48.0 (475)	0.6 (6)	0.2 (2)	22.6 (113)	0.2 (1)	0	14.0 (141)	0.2 (2)	0
Omega 3, 6 or 9 including cod liver oil	22.2 (553)	0.3 (7)	0.08 (2)	44.4 (440)	0.6 (6)	0.2 (2)	12.0 (60)	0.2 (1)	0	5.3 (53)	0	0
Protein shake	4.5 (114)	0	0	3.4 (34)	0	0	6.2 (31)	0	0	4.9 (49)	0	0
Probiotic	3.1 (47)	0.1 (2)	0	-	-	-	-	0	0	-	0.2 (2)	0

(continued on next page)

Table 3 (continued)

	Total (n=2,494)			Norway (n=990)			Sweden (n=500)			The Netherlands (n=1004)			
	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat	
	%* (n)	%* (n)	%* (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	
Glucosamine	1.9 (19)	0	0	-	-	-	4.2 (21)	-	-	2.6 (26)	1.9 (19)	0	0
Q10	0.8 (17)	0	0	0.2 (2)	0	0	-	-	-	1.5 (15)	0	0	
Other dietary supplements	2.5 (63)	0	0	2.7 (27)	0	0	4.2 (21)	0	0	1.5 (15)	0	0	

- Not asked; * Percentage calculated from respondents asked about each therapy

Table 4

Practice of self-help techniques during the first three months of the COVID-19 pandemic.

	Total (n=2,494)			Norway (n=990)			Sweden (n=500)			The Netherlands (n=1,004)		
	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat	Total	Prevent	Treat
	%* (n)	%* (n)	%* (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Use of self-help techniques	30.3 (755)	1.1 (28)	0.20 (5)	27.4 (271)	0.4 (4)	0 (0)	33.2 (166)	2.6 (13)	0.6 (3)	31.7 (318)	1.1 (11)	0.2 (2)
Breathing therapy	13.0 (65)	1.20 (6)	0.20 (1)	-	-	-	13.0 (65)	1.2 (6)	0.2 (1)	-	-	-
Yoga	11.4 (284)	0.04 (1)	0	13.0 (129)	0	0	9.4 (47)	0	0	10.8 (108)	0.1 (1)	0
Meditation/Mindfulness	11.0 (274)	0.10 (3)	0	10.7 (106)	0.2 (2)	0	12.0 (60)	0	0	10.8 (108)	0.1 (1)	0
Relaxation	8.6 (214)	0.04 (1)	0.08 (2)	7.9 (78)	0	0	7.2 (36)	0	0.2 (1)	10.0 (100)	0.1 (1)	0.1 (1)
Prayer for own health	5.6 (139)	0.50 (13)	0.12 (3)	3.8 (38)	0.1 (1)	0	3.8 (19)	1.0 (5)	0.2 (1)	8.2 (82)	0.7 (7)	0.2 (2)
Art therapy	5.6 (56)	0.10 (1)	0	-	-	-	-	-	-	5.6 (56)	0.1 (1)	0
Other	3.9 (96)	0.20 (4)	0.04 (1)	2.5 (25)	0	0	6.8 (34)	0.4 (2)	0	3.7 (37)	0.2 (2)	0.1 (1)
Visualization	2.8 (69)	0	0	3.2 (32)	0	0	2.6 (13)	0	0	2.4 (24)	0	0
Tai Chi	0.8 (19)	0	0	0.6 (6)	0	0	0.4 (2)	0	0	1.1 (11)	0.1 (1)	0
Qigong	0.7 (18)	0.04 (1)	0	0.5 (5)	0.1 (1)	0	1.4 (7)	0	0	0.6 (6)	0	0
Lightening process	0.2 (2)	0	0	0.2 (2)	0	0	-	-	-	-	-	-
Neuro-Linguistic Programming (NLP)	0.2 (2)	0	0	0.2 (2)	0	0	-	-	-	-	-	-

- Not asked; *Percentage calculated from respondents asked about each therapy

by T-test or ANOVA test for the comparison of means using Statistical Package for Social Sciences (SPSS) v. 26.0. The significance level was set to $p < 0.05$.

5. Ethics approval

Norway: Approval of the Norwegian arm of the study was applied for at the Regional Committee for Medical and Health Research Ethics (REK 2020/133217). They concluded that the project did not fall under the definition of projects to be assessed under the Health Research Act and therefore did not need approval. Informed consent was obtained from all study participants.

Sweden: The Swedish part of the study was approved by the Ethical committee, Etikprövningsmyndigheten (Dnr 2020-03026). Informed consent was obtained from all study participants.

The Netherlands: The study protocol was reviewed by the Medical Ethical Reviewing Committee of Wageningen University. They decided that this study did not fall within the remit of the Dutch Medical Research Involving Human Subjects Act (WMO), and therefore was exempt from further medical ethical review (METC-WU statement dated 25/05/2020). Informed consent was obtained from all study participants.

6. Results

6.1. Basic characteristics of respondents

The typical respondent was middle aged (49.2%) with university education (50.8%) and middle income (45.7%), however with rather large differences between the three countries. In all countries, men and women were similarly represented with a slightly younger population in Norway (mean age of 46.98 years) compared to Sweden (49.25 years) and the Netherlands (48.85 years, $p < 0.001$, Table 1). Furthermore, level of education and income varied between the countries with highest income and education in the Norwegian population ($p < 0.001$, Table 1).

6.2. Consultations with health care providers

As shown in Table 2, almost half of the respondents (45.1%) had seen a health care provider during the first three months of the COVID-19 pandemic, 51.2% in Norway, 42.8% in Sweden and 40.3% in the Netherlands ($p < 0.001$). Most of the respondents had seen a medical doctor (36.8%), a massage therapist (4.9%), or a chiropractor (2.9%).

6.2.1. Consultations with health care providers for prevention and treatment of COVID-19

Hardly any of the respondents (1.2%) had seen health care providers for the purpose of preventing COVID-19. Similar low numbers were

found in Norway (1.7%), Sweden (1.6%) and in the Netherlands (0.6%, $p=0.057$). The few who sought help from providers for this purpose mainly saw a medical doctor (0.9%, Table 2). Very few sought also help from health care providers to treat COVID-19-related symptoms (1.0%). Those who did saw a medical doctor.

6.3. Use of self-management strategies

6.3.1. Natural remedies, vitamins, minerals and dietary supplements

The majority of the respondents (62.8%) used natural remedies, vitamins, minerals or dietary supplements during the first three months of the COVID-19 pandemic, 72.8% in Norway, 50.0% in Sweden and 59.4% in the Netherlands ($p<0.001$). As shown in Table 3, vitamins and mineral (49.9%), and dietary supplements (29.2%) were most frequently used, in particular omega 3, 6 or 9 (22.2%), vitamin D (21.2%), multivitamin tablets (17.5%), vitamin C (15.7%), and magnesium (11.4%).

6.3.2. Practice of self-help techniques

Self-help techniques were used by 30.3% of the respondents during the first three months of the COVID-19 pandemic, 27.4% in Norway, 33.2% in Sweden and 31.7% in the Netherlands ($p=0.032$). As shown in Table 4, yoga (11.4%), meditation/mindfulness (11.0%), and relaxation techniques (8.6%) were the most used techniques across all countries as well as in Norway and the Netherlands while breathing therapy was most used in Sweden (13.0%).

6.4. Use of self-management strategies for prevention or treatment of COVID-19

Despite rather high use of dietary supplements (including natural remedies, vitamins and minerals), and self-help techniques, few respondents used this specifically for prevention (4.4%) or treatment (0.4%) of COVID-19. When used for prevention, vitamins and minerals were most used (2.8%), most frequently vitamin C (1.7%) followed by vitamin D (0.9%), and multivitamins (0.5%, Table 3). Most use of vitamins and minerals for prevention of COVID-19 was found in the

Netherlands (4.1%), followed by Sweden (3.2%) and Norway (1.2%, Table 3, $p<0.001$). Also prayer was to some extent used for prevention (0.5%).

Only nine respondents had used self-management strategies to treat COVID-19 related symptoms. The strategies they used were: Vitamin C ($n=3$), prayer for own health ($n=3$), vitamin D ($n=2$), Omega 3, 6, 9 fatty acids ($n=2$), relaxation exercise ($n=2$), unspecified vitamins and minerals ($n=2$), ginger ($n=1$), garlic ($n=1$), ginkgo biloba ($n=1$), magnesium ($n=1$), zinc ($n=1$), breathing exercise ($n=1$), unspecified herb ($n=1$), and unspecified self-help technique ($n=1$, Tables 3 and 4). These respondents ($n=9$) were equally distributed between the three countries with 2 from Norway, 4 from Sweden and 3 from the Netherlands (Tables 3 and 4, $p=0.941$) and had used a mean of 2.4 therapies each to treat COVID-19.

6.5. Worries of being infected by the COVID-19 disease

The worry of being infected with COVID-19 varied greatly across the three countries studied (Table 5, $p<0.001$). While most respondents from Norway and Sweden reported no worries about being infected by COVID-19 themselves (66% and 57% respectively), only 38.8% in the Netherlands felt the same way. They were more likely to be somewhat worried (42%). Few across all countries (15.4%) were very worried of being infected ranging from 11.2% to 19.1% between the countries (Table 5). When it came to worries for loved ones, people were in general somewhat (34.8%) or very (43.2%) worried. While half of the respondents in Norway and Sweden were very worried, respondents in the Netherlands were most likely to be somewhat worried (47%) that loved ones could be infected with COVID-19 (Table 5).

6.6. Consultations with health care providers and use of self-management strategies for prevention related to worries about COVID-19

The users of health care providers and self-management strategies for prevention of COVID-19 were more likely to be very worried (24.4%) of being infected by COVID-19 than respondents who did not use this for prevention (14.4%, $p=0.008$, Table 5). This was also the tendency

Table 5
Worries about being infected by the COVID-19 disease and use of self-management strategies for prevention of COVID-19.

	Total	Norway	Sweden	The Netherlands		Use of self-management strategies to prevent COVID-19		p-value*
				% (n)	p-value*	Yes	No	
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	
How worried are you of getting infected with the virus causing COVID-19					<0.001			0.008
Not worried	53.2 (1302)	66.0 (646)	57.0 (284)	38.8 (390)		44.4 (60)	53.7 (1260)	
Somewhat worried	34.4 (778)	22.8 (223)	26.7 (133)	42.0 (422)		31.1 (42)	31.4 (736)	
Very worried	15.4 (383)	11.2 (110)	16.3 (81)	19.1 (192)		24.4 (33)	14.4 (350)	
How worried are you that some of your friends and family could get infected with the virus causing COVID-19					<0.001			0.092
Not worried	22.1 (547)	23.0 (225)	23.5 (117)	20.4 (205)		18.4 (25)	22.3 (522)	
Somewhat worried	34.8 (862)	26.7 (261)	25.9 (129)	47.0 (472)		29.4 (40)	35.1 (822)	
Very worried	43.2 (1071)	50.3 (492)	50.6 (252)	32.6 (327)		52.2 (71)	42.7 (1000)	
COVID-19 is more dangerous than an ordinary influenza					<0.001			0.686
No more dangerous	5.2 (128)	8.7 (83)	6.4 (31)	1.4 (14)		6.1 (8)	5.2 (120)	
Somewhat more dangerous	16.2 (396)	16.9 (162)	16.0 (78)	15.5 (156)		13.7 (18)	16.3 (378)	
Much more dangerous	78.6 (1924)	74.4 (711)	77.7 (379)	83.1 (834)		80.2 (105)	78.5 (1819)	

* Pearson chi-square test

regarding worries for loved ones and the impression that COVID-19 is more dangerous than ordinary influenza, however, not at a significant level ($p=0.092$ and $p=0.686$ respectively, Table 5).

7. Discussion

Despite different containment and mitigation measures in Norway, Sweden and the Netherlands to handle the early phase of the COVID-19 pandemic, the results from this study show a similar pattern in consultations with health care providers and the use of self-management strategies in relation to COVID-19. Only a very small number of people in any of the three countries used self-management strategies with the intention to prevent or treat COVID-19 (3.4% and 0.2% respectively). Similarly, the number of people who consulted a health care provider to treat or prevent COVID-19 was very low (1.2% and 1.0% respectively). Most importantly, all consultations with health care providers for the treatment of COVID-19 were to medical doctors, no consultations with other health care providers were reported for this purpose. The low prevalence of therapies used to treat COVID-19 might be due to the rather low number of infected people at the time of the study. It is therefore likely that a survey among people infected with COVID-19 would have produced different results.

By large, the findings from this study do not point to any dramatic changes in people's use of self-management strategies during the early phase of the pandemic. The number of people who had consulted health care providers was however somewhat lower than previously reported.^{22, 23} This may partly be due to the shorter time frame in the current study (3 months vs. 12 months) and partly due to restrictions regarding physical contact, though many health care providers reorganized their clinical practice to be able to offer support to their patients.²⁴

Overall, these findings support previous research suggesting that people's consultations with health care providers and use of self-management strategies are not associated with unrealistic hopes and expectations, or an irrational behavior to treat and prevent acute medical illness. People rather use these strategies to cope with long-term conditions.^{23, 25, 26} The low number of respondents using self-management strategies to prevent or treat COVID-19 in all three countries further suggests that the phenomenon of self-management strategies is deeply rooted in culture, context and behavior and is rather independent of health care system.

Despite similarities in the use of self-management strategies in relation to COVID-19 across the three countries, it is interesting to note that the popularity of certain dietary supplements seems to differ, as other international surveys have proposed (e.g.²⁷). The most obvious example is an extensive use of omega 3, 6, 9 and cod liver oil in Norway (44%) compared to 12% in Sweden and 5.3% in the Netherlands. Also the use of vitamins and minerals (especially vitamin D, vitamin C and multivitamins) seems more prominent in Norway and in the Netherlands compared to Sweden. While homeopathic remedies were rarely used in Norway and Sweden, they were used by almost 10% of the respondents in the Netherlands, however, not for treatment nor prevention of COVID-19.

Although there have been concerns that the COVID-19 pandemic might trigger a surge in the use of dietary supplements associated with fraudulent claims, the results from this study suggest that the large majority of users in Norway, Sweden, and the Netherlands did not use these products to prevent or treat COVID-19. Interestingly, two of the most frequently used vitamins during this period, vitamin C and vitamin D, have been marketed with fraudulent claims for the treatment and prevention of COVID-19,²⁸ and were at an early stage of the pandemic investigated in a number of clinical trials for the treatment and prevention of COVID-19. While these fraudulent claims and ongoing research projects may have had an influence on the usage reported here, our findings support previous findings that such use is not associated with unrealistic expectations.²⁹

Regarding self-help techniques were yoga, meditation/mindfulness and relaxation techniques popular techniques in all three countries. These findings are indeed interesting from a public health perspective, given the clinical potential of some of these techniques, e.g. mindfulness/meditation for improving depression and other mental health problems,³⁰ problems which have been particularly prominent during the pandemic. The potential of these techniques is confirmed both in current practice within the formal health care systems³¹ and ongoing research to provide support during the pandemic (e.g.³²).

Although a minority, some respondents in this study did report consulting health care providers and using self-management strategies to prevent or treat COVID-19. These respondents were also more likely to be worried of being infected by COVID-19 than respondents who did not use this for prevention (24.4% vs 14.4%, $p=0.008$). This is in line with previous research showing that high levels of anxiety correlate with usage of self-help techniques, natural remedies, dietary supplements and consultations with healthcare providers.³³

7.1. Methodological considerations

Strengths of this study are that we used large representative samples of the population in all three countries, used questions from the validated and adapted I-CAM-Q,¹⁸ and conducted the survey during the first months of the pandemic. Being an international study involving three countries with different containment strategies, we also expected to cover possible effects that these strategies might have on health care provider consultation and the use of self-management strategies. A limitation of the study is that we do not know how many of the respondents were actually infected with COVID-19. Due to limitations in the testing capacity during the first months of the pandemic, people were not tested for COVID-19 unless they had very severe symptoms or had been in direct contact with a person with a confirmed infection. Respondents reporting to have treated COVID-19 related symptoms with one or more of the listed therapies might therefore be self-diagnosed and not confirmed infected with COVID-19. Due to word limitations were data on self-reported effect of the therapies, possible side effects and source of information not reported in this paper, but will be explored in future articles.

The response rate varied between the countries (Norway 34.5%, Sweden 53.8% and the Netherlands 22%). Although the total number of included individuals is rather high ($n=2,494$), and quotas by age, sex and region of residence were used to ensure representability of the populations among the respondents, the rather low response rate limits the strength of conclusions that can be drawn from this study.

7.1.1. Implication of the findings

To meet questions related to the use of self-management strategies including dietary supplements in the context of the COVID-19 pandemic, health care professionals are advised to rely on evidence-based information sources that include regular updates on on-going research and warnings regarding fraudulent claims and to advice their patients in a personalized manner depending on their specific circumstances. The findings from this study will therefore provide health care providers, authorities and scientists with valuable insights in order to guide future communication and research, and to support rational decision-making in pandemic times.

8. Conclusions

According to our findings, the COVID-19 pandemic does not seem to have evoked a large-scale difference in behavior related to consultations with health care providers or the use of self-management strategies such as dietary supplements and self-help techniques in any of the three countries. The majority use natural remedies, dietary supplements and/or self-management strategies but not with the intention to prevent or treat COVID-19.

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Authors' contributions

The study was conceived by Agnete Egilsdatter Kristoffersen, and all authors contributed to the design of the study. Agnete Egilsdatter Kristoffersen coordinated the study in Norway, Johanna H. Nordberg in Sweden, and Esther T. van der Werf in the Netherlands. Agnete Egilsdatter Kristoffersen, Trine Stub and Frauke Musial designed the Norwegian questionnaire, Johanna H. Nordberg, Jenny-Ann B. Danell and Kathrin Wode translated and adapted the Norwegian questionnaire to Swedish while Miek Jong, Barbara Wider and Esther T. van der Werf translated and adjusted the questionnaire to Dutch. Agnete Egilsdatter Kristoffersen performed the initial and final analyses and prepared the tables and figures. Agnete Egilsdatter Kristoffersen, Miek Jong and Johanna H. Nordberg drafted the initial version of the paper. All authors reviewed the initial version of the paper, made substantial contributions to subsequent versions, and read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at [10.1016/j.ctim.2021.102792](https://doi.org/10.1016/j.ctim.2021.102792).

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