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ORIGINAL ARTICLE



Psychometric Properties of the Norwegian Version of the Fear of COVID-19 Scale

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Fagsenter for pasientrapporterte data

- Vi har god kompetanse knyttet til PRO, og lang erfaring med forskning på pasientrapporterte data



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Collaboration



NASJONALT SERVICEMILJØ FOR MEDISINSKE KVALITETSREGISTRE

Fagsenter for pasientrapporterte data

Institutt for global helse og samfunnsmedisin

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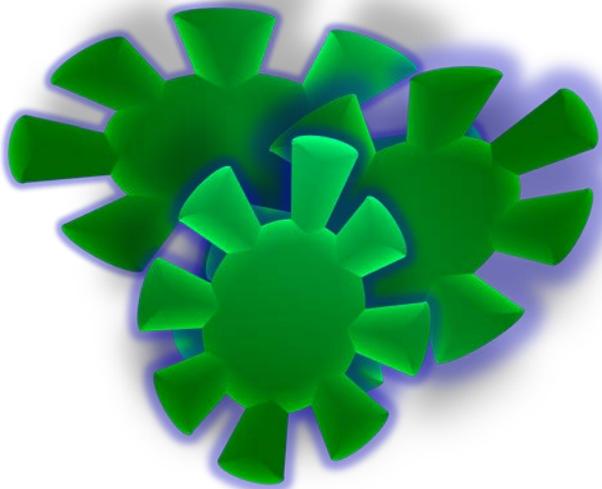
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FORSKNINGSPROSJEKT

Bergen i Endring COVID19 studien - BiE studien

Bergen kommune, Folkehelseinstituttet og Universitetet i Bergen har sammen utarbeidet en spørreundersøkelse for å få kunnskap om hvordan livet til innbyggerne i Bergen kommune er nå. Spørreundersøkelsen vil ta ca. 10-15 minutter å besvare og 80 000 voksne innbyggere i Bergen kommune er tilfeldig trukket ut og invitert til frivillig deltakelse.

Coronavirus disease 2019 (COVID-19)



A severe acute respiratory syndrome

11th March 2020 the World Health Organisation declared a pandemic.

COVID-19 is highly infectious virus - can be asymptomatic or lead to mild symptoms -

25% of those infected it causes severe morbidity requiring acute medical intervention and for some mortality.

COVID-19 pandemic potentially triggering fear and anxiety

Lack of robust specific screening tools

- Traditional assessment tools (e.g. PHQ-9, HADS, GAD-7) may lead to under-diagnosis or over-diagnosis due to poor COVID-19 specific face validity
- Therefore development: Fear of COVID-19 Scale (FCV-19S)
- Timely and important
- Mental health care and fear of COVID-19 necessitate greater attention during the COVID-19 pandemic

Comparative research is required



Unidimensional?

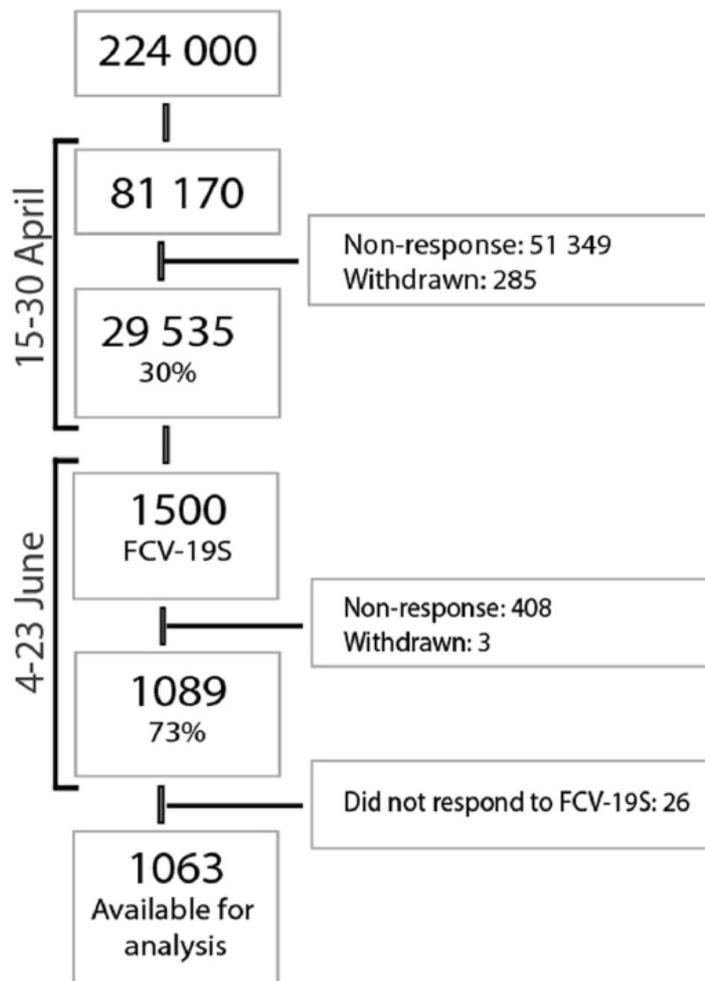
The FCV-19 scale **assumed to have an unidimensional** structure

- The unidimensional structure **supported** by several translated versions
- Eastern European and Israeli version suggests a **bi-dimensional structure** representing physiological responses (three questions) and emotional responses (four questions), respectively
- New Zealand and Greek studies **revealed weaker fit values** based on conventional assumptions, they did **not modify the models**
- The Arabic and Italian versions **confirmed an unidimensional structure** when the model had been **modified** to allow for a number of correlations between pairs of residuals
- Since such correlated residuals **might signal multidimensionality**, in-depth investigation of the FCV-19S factor structure is warranted.

AIM

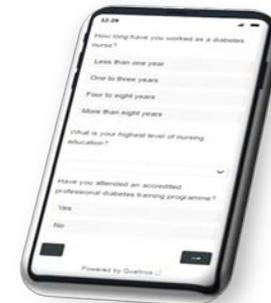
- To examine **the psychometric properties** of the Norwegian version of the FCV-19S
- **Construct validity:**
 - tested whether confirmatory factor analysis would detect a one-factor structure in these data.
 - If the fit of the unidimensional model is unsatisfactory, exploratory analysis to analyse the dimensionality of the scale.
- **Concurrent validity,**
 - Hypothesis:
 - the FCV-19S scores are negatively associated with satisfaction with life
 - the FCV-19S scores are positively associated with the shortened Hopkins symptom checklist (SCL-10)
 - the FCV-19S scores are discriminates between men and women and those with high and low socioeconomic status

Flowchart of selection and inclusion



Measurements

1. Demographic information (education level, household income, employment status before the COVID-19 outbreak etc)
2. COVID-19 Specific Questions (related to the last 4 weeks included quarantine, social distancing, working from home and/or home schooling etc)
3. General Health and Meaningfulness (2 questions)
4. The 10-Item Hopkins Symptom Checklist SCL-10 (anxiety and depression)
5. Fear of COVID-19 Scale (7 questions)



Data collection

15/16 - 30 April 2020: First wave

- Electronic battery of questionnaires was distributed (email / SurveyXact system).

4 - 23 June 2020: Second wave

- For this validation study, a follow-up emailing was performed.
- Questionnaires **including FCV-19S** (email through the SurveyXact system)
- Randomly selected individuals (n=1500). Two reminders.

By this time, the restrictions had brought the pandemic under control in Norway, and the restrictions had been eased at the time of the second emailing. Schools had re-opened, and organized sports activities were slowly picking up. However, social distancing and the advice to avoid public transport were still maintained.

Results - Characteristics

Table 1 Socio-demographic data ($N=1063$)

Variables	Frequency	Percentage
Gender		
Female	588	55.3
Male	475	44.7
Age categories (in years)		
18–29	129	12.1
30–49	150	14.1
40–49	186	17.5
50–59	227	21.4
60–69	201	18.9
70–79	170	16.0
Education ($n = 989$)		
Primary and lower secondary school (10 years)	65	6.1
Upper secondary school	291	27.4
University less than 4 years	230	21.6
University ≥ 4 years	403	37.9
Household income (NOK ^a) (including benefits) ($n = 899$)		
< 250,000	117	13.0
250,000–500,000	384	42.7
> 500,000	398	44.3

COVID-19 Specific Questions

Table 2 Coronavirus-related actions over the last 4 weeks ($N = 1048$)

Actions	Frequency	Percentage
Have been in quarantine	187	17.8
Have been ill with suspected, possible or confirmed COVID-19 infection	62	5.9
Have been working from home or home schooling	522	49.8
Have been in household with a person with suspected, possible or confirmed COVID-19 infection	53	5.1
Have tried to keep a distance from people around me	919	87.7

Frequency distribution of answers

- As many as 14.5% strongly disagreed with all the FCV-19S items and therefore had the lowest possible sum score.
- This is close to the conventional cut-off for a floor effect (Terwee et al. 2007)
- However, the results of the study should be interpreted in light of the prevalence of COVID-19 in Norway at the time of the data collection.
- Apart from some extremely low scorers, which is not unexpected given the data collection period, the distribution of the total scale score seems to be rather close to a normal distribution

Reliability

- Both Cronbach's alpha (0.88) and Omega alphaTotal ($\omega_t = 0.91$) indicate that the scale has a very good internal consistency.
- However, the Omega alphaHierarchical (ω_h) coefficient suggests that the general factor is not very strong explaining only 69% of the total variance.

Table 4 Fit of models

	Chi-squared robust	CFI robust	RMSEA robust	SRMS robust
M1: One-factor model	359.05 df= 14, $p < 0.001$	0.972	0.152 (0.139, 0.166)	0.082
M1b with five correlated pairs of residuals	41.59, df= 9, $p < 0.001$	0.997	0.058 (0.041, 0.077)	0.021
M2: Two-factor model	197.24, df= 13, $p < 0.001$	0.985	0.116 (0.102, 0.130)	0.051
M2b: Alternative two-factor model with four correlated pairs of residuals	32.75, df= 9, $p < 0.001$	0.998	0.050 (0.032, 0.069)	0.019
M3: Second-order model	32.75, df= 9, $p < 0.001$	0.998	0.050 (0.032, 0.069)	0.019

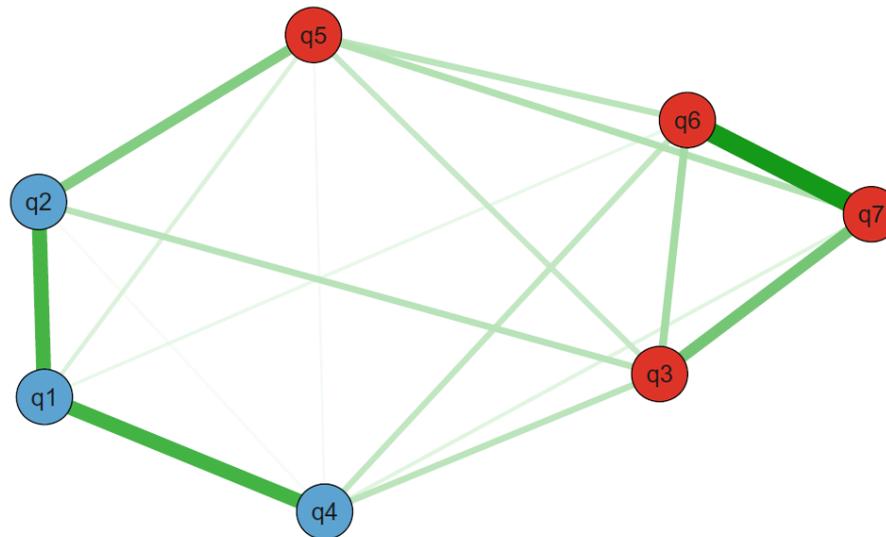
The one-factor model (M1) has an unsatisfactory fit to the data

Acceptabel:

CFI values > 0.90 together with RMSEA values < 0.08 and SRMR < 0.08 (Brown 2006),

Preferred:

CFI values > 0.95 and RMSEA < 0.06 and SRMR < 0.05



Explorative dimensionality assessment by Explorative Graph Analysis detecting the number of factors of Fear of COVID-19 Scale. The colour of the nodes represents dimensions while the thickness of the lines resents the size of the partial correlation. q1–q7 refer to questions in FSV-19S as written in full Table 3

- Explorativ Graph Analysis
- The Norwegian version of the FCV-19S showed an underlying two-factor structure.
- However, the high correlation means the two latent factors (cognitive and somatic fear) act as indicators for a secondorder general factor and support use of the FCV-19S sum score.

Questions pr. factor

Cognitive fear

- Q1 Jeg er veldig redd for COVID-19,
- Q2 Jeg synes det er ubehagelig å tenke på COVID-19
- Q4 Jeg er redd for å dø på grunn av COVID-19

Somatic fear

- Q3 Jeg blir svett i hendene når jeg tenker på COVID-19,
- Q5 Jeg blir nervøs eller engstelig når jeg ser nyheter og innlegg om COVID-19 i sosiale medier
- Q6 Jeg får ikke sove fordi jeg bekymrer meg for å få COVID-19
- Q7 Jeg får hjertebank eller urolig hjerte når jeg tenker på å få COVID-19

Concurrent validity

- The sum score of FCV-19S correlated significantly with other constructs (SCL-10) ($r = 0.35$, $p < 0.001$) and lower life satisfaction ($r = -0.19$, $p < 0.001$)
- A higher FCV-19S score was positively associated with being female, older age groups, and lower socioeconomic status (lower education and income).
- FCV-19S was statistically significantly associated with
 - being worried that they themselves and their family could be infected by the virus,
 - worries linked to the possibility of experiencing financial problems or losing or being laid off from their job.
- FCV-19S correlated with one question concerning coronavirus-related actions over the last 4 weeks before the survey, e.g., a negative correlation with working from home or home schooling.
- The cognitive ($r = 0.91$) and somatic ($r = 0.90$) subscales had similar associations with the sum score of FCV-19S, as well as other constructs.

Summary

- Exploratory graph analysis and confirmatory factor analysis found support for a two-factor model (cognitive and somatic fear), which were highly correlated ($r = 0.84$).
- This model is theoretically meaningful and supports use of the FCV-19S sum score.
- The FCV-19S appears to be a valid instrument to assess fear of COVID-19 with good psychometric properties.

The Fear of COVID-19 scale (FCV-19S)

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BRIEF REPORT

The Fear of COVID-19 Scale: Development and Initial Validation

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Mark D. Griffiths⁴ · Amir H. Pakpour^{5,6}



Skal måle korona-frykt i Norge

Medisinske kvalitetsregistre kan snart ta i bruk «Fear of covid-19», et instrument for å måle frykten for korona i befolkningen.

Anne Grete Storvik
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**Tilgjengelighet på andre språk:
engelsk, fransk, spansk, punjabi, persisk, hebraisk, russisk, arabisk og urdu**

Henvendelse for bruk av norsk versjon:

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