

## ORIGINAL ARTICLE OPEN ACCESS

# Parent's Motivation and Behaviour to Protect Their Children From COVID-19: A Prospective Test of Self-Determination Theory

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## ABSTRACT

**Background:** This two-wave prospective study aims to apply self-determination theory (SDT) to understand how parents are motivated to protect their young children from COVID-19. We hypothesised that psychological need support from society and autonomous motivation from parents were predictive of parent's future engagement in preventive behaviours against COVID-19 for their children.

**Methods:** Participants were 689 US parents or legal caregivers of 3- to 8-year-old children. They completed an online survey comprising previously validated measures of psychological need support, autonomous motivation from SDT and behavioural adherence to COVID-19 prevention at baseline and a 1-month follow-up. Confirmatory factor analysis and structural equation modelling were employed to test the hypothesised relationships.

**Results:** Structural equation modelling revealed that psychological need support and autonomous motivation at baseline were positively related to parents' adherence to COVID-19 preventive behaviours at follow-up.

**Conclusion:** The findings suggest that the provision of autonomy-supportive and need-satisfying social environments may promote greater COVID-19 preventive behaviours in parents for their children and provide formative evidence to inform future interventions.

## 1 | Introduction

Compliance with preventive behaviours, such as maintaining social distancing, wearing face coverings, minimising group gatherings and practising proper hand hygiene, is essential to reduce the transmission of the SARS-CoV-2 virus that causes COVID-19. Such compliance is essential because it could reduce the rate of COVID-19 infections and mitigate pandemic transmission [1, 2]. Minimising the transmission of the virus among children and young people is an important factor in reducing the number of cases of severe acute infections among them [3]. Parents

have a crucial responsibility to minimise the risk of COVID-19 infection in their children [4, 5]. Identifying the motivational factors that may affect parent's compliance with COVID-19 preventive actions for their children is highly important, as it may yield viable targets for efficacious behavioural interventions (e.g., messaging-related campaigns) to promote these behaviours. Motivational theories derived from social psychology may be useful in identifying these factors [6–8]. In the current study, we conducted a preliminary test of self-determination theory [9, 10], which is a prominent motivational theory that has been widely applied in health behaviour contexts [11, 12], to identify

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the motivational determinants of parent's behavioural adherence to COVID-19 preventive behaviours for their young children and the mechanisms involved.

## 1.1 | Theoretical Framework

According to self-determination theory [9, 10], individual's long-term adherence to a particular health behaviour [6, 13] is governed by the quality of their motivation. Central to the theory is the distinction between autonomous and controlled forms of motivation. Autonomous motivation reflects engaging in a given behaviour for self-endorsed, personally relevant reasons, while controlled motivation reflects engaging in the behaviour for externally referenced reasons [9, 10]. Performing behaviours for autonomous reasons is related to behavioural persistence and adaptive outcomes (e.g., interest, positive affect, well-being), whereas acting for controlled reasons is related to desistance and maladaptive outcomes (e.g., negative affect, ill-being) [11, 12]. The primary driver behind the type of motivation experienced when performing actions is the extent to which the behaviour is perceived to satisfy the basic psychological needs for autonomy, competence and relatedness [10]. When the social environment of a given behaviour is perceived as supporting psychological needs, individuals are more likely to experience the behaviour as autonomous and are, therefore, more likely to take up and persist with the behaviour. Support for autonomy provided by social agents in the social environment can foster autonomous motivation, and interventions fostering autonomy-supportive environments tend to increase autonomous motivation and behavioural performance in behaviour contexts [11, 12].

These also imply a mediation model in which relationships between psychological needs and adaptive behavioural engagement and persistence are mediated by autonomous motivation. The proposed model has been supported by previous research in multiple populations and health behaviours [11, 12], including wearing facemasks to prevent infection spread during the H1N1 pandemic [14, 15]. Recent research has also highlighted the potential of self-determination theory and the process mode to identify the determinants of COVID-19 preventive behaviours, such as social distancing measures and the mechanisms involved [6, 13]. Such research may provide crucial formative evidence to assist in the development of optimally effective interventions to promote preventive behaviours in the context of the COVID-19 pandemic.

## 1.2 | The Present Study and Hypotheses

In the current research, we tested the proposed process model based on self-determination theory [9] to predict parent's participation in COVID-19 preventive behaviours for their young children. We aim to test our model in a two-wave prospective survey study on parents of 3- to 8-year-old children. The current study is important in the context of the COVID-19 pandemic because parents are ultimately responsible for taking preventive measures to minimise the risk of COVID-19 infections in their children [4, 5]. Given that little research has examined parent's adherence to preventive behaviours against COVID-19 for young children [16], our study can provide essential information about the associations between motivational factors and preventive

behaviours as well as the mechanisms involved. If these factors are assumed to be manipulable, the current research may provide insight into interventions to promote parent's behaviours to prevent COVID-19 for their children [12].

Based on the tenets of self-determination theory and our proposed process model [9, 10] and consistency with previous applications of the theory of health behaviour contexts [11, 12, 15–18], we proposed the following hypotheses:

- H1: Psychological need support for parents to perform COVID-19 preventive behaviours for their young children would be positively related to autonomous motivation toward performing these behaviours.
- H2: Parent's autonomous motivation to perform COVID-19 preventive behaviours for their young children would be positively related to adherence to these behaviours.
- H3: Parent's autonomous motivation to perform COVID-19 preventive behaviours for their young children would mediate the positive relationship between psychological need support and behavioural adherence to these behaviours.

## 2 | Method

### 2.1 | Participants and Procedures

This research protocol was approved by the Human Research Ethics Committee of the corresponding author's institution (Ref. no. 2019-2020-0306). The study adopted a two-wave prospective survey design in which parents of 3- to 8-year-old children completed self-report measures of the study constructs at two points in time, separated by 1 month. We used *Prolific*, an online survey panel, to recruit eligible parents residing in the United States for the study. Adult parents ( $N = 787$ ) with at least one child aged under 18 were initially recruited between 9 and 16 July 2020. In that period of time, the infection rate increased rapidly, with an average of 55,000 new confirmed COVID-19 cases and 639 deaths reported daily [18]. In regard to the basic personal information provided by the participants, we identified 689 parents ( $M$  age = 33.15,  $SD = 5.58$ , 46.88% male) who fulfilled our inclusion criteria, who resided in the United States, had at least one child, with their oldest child aged between 3 and 8 years of age and whose child had not been diagnosed with COVID-19. The sample size was considered adequate based on our initial estimation (i.e., the minimum sample size required = 631;  $df = 136$ ; desired power = 0.80; 90% RMSEA = 0.04–0.05) by statistical power analysis of structural equation modelling (SEM) [19].

The participants had an average of 1.70 ( $SD = 0.71$ ) children. Their oldest child was aged 5.15 years ( $SD = 1.54$ ) on average, and the gender distribution of their oldest child was almost balanced (55.30% male). The sample was highly educated, with 75.90% of the participants having a university education. During the study period, 39.77% of the participants were subject to state-wide stay-at-home orders, and the states where the participants resided recorded a total of 840,250 new confirmed COVID-19 cases and 23,336 deaths from COVID-19 [20]. The participants signed the consent form to indicate that they understood the participation rights, procedures, benefits and risks of the research. They subsequently completed an initial online survey at the first data

collection occasion (baseline, T0) and with a second survey 1 month later (follow-up, T1). At T0, the survey included the measures of background information and demographic data and the validated measures of psychological need support and autonomous motivation with respect to COVID-19 preventive behaviours performed by parents for their children. At T1, the survey only included self-report measures of adherence to these preventive behaviours. The items of the surveys are available in the online supplementary document of the previous study [16].

A majority of the participants ( $N = 596$ ) at T0 completed the follow-up survey at T1 (response rate = 86.50%). The participants received an inconvenience allowance of £1.88 for completing the survey at each time point. We had to point out that a published paper [16] also utilised the same dataset to examine the relationship between SDT variables and the factors of the theory of planned behaviour [21]. However, our present study is original in its focus on the predictive power of SDT factors on behavioural adherence. Therefore, our research provides novel insights into the direct and indirect predictive effects of psychological need support and motivations on behavioural adherence, which have never been reported before.

## 2.2 | Measures

### 2.2.1 | Psychological Need Support (T0)

We adopted a short-form six-item version of the Health Care Climate Questionnaire (HCCQ) [22] to measure the degree to which parents perceived their social environment as supportive of their psychological needs for COVID-19 prevention for their children. Participants responded to the items on a 7-point Likert Scale (ranging from 1 = 'strongly disagree' to 7 = 'strongly agree'). Consistent with previous studies [15, 23], we adapted the scale to make the items relevant to our study context. Items were preceded by a common stem: 'For preventing my child from getting COVID-19, ...', and the social agent changed to 'the social environment' (e.g., 'I feel that social environment provided me with choices and options'). The scale exhibited adequate internal consistency ( $\alpha = 0.93$ ).

### 2.2.2 | Autonomous Motivation (T0)

We adopted six items from the Treatment Self-Regulation Questionnaire (TSRQ) [24] to measure parent's autonomous motivation for preventing their child from COVID-19. Some of the items were adapted to refer to the context of COVID-19 prevention. Participants were initially presented with a common stem: 'I want to prevent my child from getting COVID-19 because ...' followed by each item (e.g., 'I feel that I want to take responsibility for my child's health'). Participants also responded to the items on a 7-point Likert scale (ranging from 1 = 'not at all true' to 7 = 'very true'). The internal consistency of the autonomous motivation scale was satisfactory ( $\alpha = 0.94$ ).

### 2.2.3 | Behavioural Adherence (T1)

We adopted two items from the COVID-19 prevention version of Self-Reported Treatment Adherence Scale (SRTAS) [17, 25] from

a recent study [16] to measure participant's adherence to COVID-19 preventive behaviours for their children. Participants indicated how frequently and how much effort they put into COVID-19 preventive actions for their children, with responses on a seven-point Likert scale (ranging from 1 = 'never/minimum effort' to 7 = 'very often/maximum effort'). In addition to the measures of frequency and effort, there are some items to assess parent's adherence to COVID-19 prevention, reflecting which types of preventive strategies parents typically adopt to minimise their child's risk of getting COVID-19. These strategies included the application of facemasks, personal and environmental hygiene and social-distancing measures that were consistent with the guidelines recommended by the Centres for Disease Control and Prevention [26], National Health Service [27] and the World Health Organisation [28]. Participants responded (1 = 'yes' or 0 = 'no') to 20 items representing whether they adopted preventive strategies, such as 'wearing a mask when I go out', 'keeping your child's hands clean' and 'reducing social activities'. Participants could also report if they applied any other preventive strategies in an open-ended question. Following the coding procedures of the COVID-19 prevention version of SRTAS [16], we included an additional strategy to assess parent's provision of education/training for enhancing children's knowledge and awareness of COVID-19 prevention. Therefore, we scored participant's adherence to COVID-19 preventive strategies for their children in a total of 21 items; the sum of these scores served as the third indicator of behavioural adherence. The standardised scores of the three indicators (i.e., frequency, effort and preventive strategies) were used to assess parent's behavioural adherence. This scale had good internal consistency ( $\alpha = 0.88$ ).

### 2.2.4 | Perceived Vulnerability (T0) and Perceived Severity (T0)

Perceived vulnerability (e.g., 'My children are vulnerable to contracting COVID-19') and perceived severity (e.g., 'COVID-19 infection may lead to serious health problems for my children') to COVID-19 were measured on three items adapted from a previous study [15] in the context of H1N1 prevention. Responses were made on a 7-point Likert scale that was identical to that used in the HCCQ. The internal consistencies for the perceived vulnerability ( $\alpha = 0.94$ ) and perceived severity ( $\alpha = 0.85$ ) scales were satisfactory.

### 2.2.5 | Demographic Variables

Participants self-reported their age, gender and highest educational level as well as their residence state. We also retrieved data from the CDC database on the number of new confirmed COVID-19 cases and deaths and the presence of stay-at-home orders in the states where the participants resided in June 2020. These variables were used as covariates in subsequent analyses.

## 2.3 | Data Analysis

We assessed the data by fitting a model that specified the hypothesised relationships among the study constructs in our proposed process model using confirmatory factor analysis and SEM with

**TABLE 1** | Descriptive statistics, Pearson's correlations and reliability indices ( $N = 689$  at T0;  $N = 596$  at T1).

	1	2	3	4	5	6	7	8	9	10	11
1. Psychological need support (T0)	—										
2. Autonomous motivation (T0)	0.33**	—									
3. Behavioural adherence to COVID-19 prevention (T1)	0.36**	0.60**	—								
Confounding variables at T0											
4. Perceived vulnerability	-0.06	-0.13**	-0.25**	—							
5. Perceived severity	-0.03	-0.29**	-0.32**	0.43**	—						
Demographic variables at T0											
6. Gender of parents	-0.04	0.07	0.02	0.04	-0.01	—					
7. Age of parents	-0.02	0.01	0.00	0.02	0.00	-0.17**	—				
8. Highest education level of parents	0.21**	0.03	0.03	0.04	0.04	-0.16**	0.21**	—			
9. Stay-at-home orders in June	0.13**	0.04	0.10*	0.00	-0.01	-0.02	-0.02	0.11**	—		
10. Number of COVID-19 confirmed cases in June	0.03	0.01	0.06	-0.01	-0.10*	0.01	-0.03	-0.05	0.12**	—	
11. Number of COVID-19 Death Cases in June	0.16**	0.05	0.10*	0.02	-0.02	0.00	-0.02	0.12**	0.60**	0.35**	—
Mean	4.69	6.44	0.00	4.78	3.72	0.53	33.15	2.99	0.40	41,037.59	1091.15
SD	1.49	0.95	1.00	1.56	1.71	0.50	5.58	0.99	0.49	39,467.55	791.51
Cronbach's alpha	0.93	0.94	0.88	0.84	0.85	—	—	—	—	—	—

\* $p < 0.05$ .\*\* $p < 0.01$ .

robust maximum likelihood estimation in Mplus (Version 8.4). Confirmatory factor analysis was used to examine the psychometric properties of the measurement model comprising psychological need support, autonomous motivation and behavioural adherence. Our main analysis applied SEM to examine H1, H2 and H3. The model specified the effects of psychological need support at T0 on parent's behavioural adherence to COVID-19 preventive behaviours for their children at T1 mediated by autonomous motivation. We hypothesised significant effects of psychological need support (H1) and autonomous motivation (H2) on behaviours and a statistically significant indirect effect of need support on behavioural adherence mediated by autonomous motivation (H3). Risk perceptions (i.e., perceived severity, perceived vulnerability), demographic variables (e.g., age, gender) and COVID-19 prevalence (i.e., newly confirmed COVID-19 cases and deaths, the existence of a stay-at-home order) with significant zero-order correlations with autonomous motivation (T0) and behavioural adherence (T1) were included as additional covariates in the structural equation model. Multiple goodness-of-fit indices were used to assess the fit of the model with the data: the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI) and standardised root mean square residual (SRMR). The RMSEA and SRMR should be less than 0.08, and the CFI and TLI should exceed 0.90 for well-fitting models [29]. Missing data at random and the participants' dropout across time (13.50%) were imputed

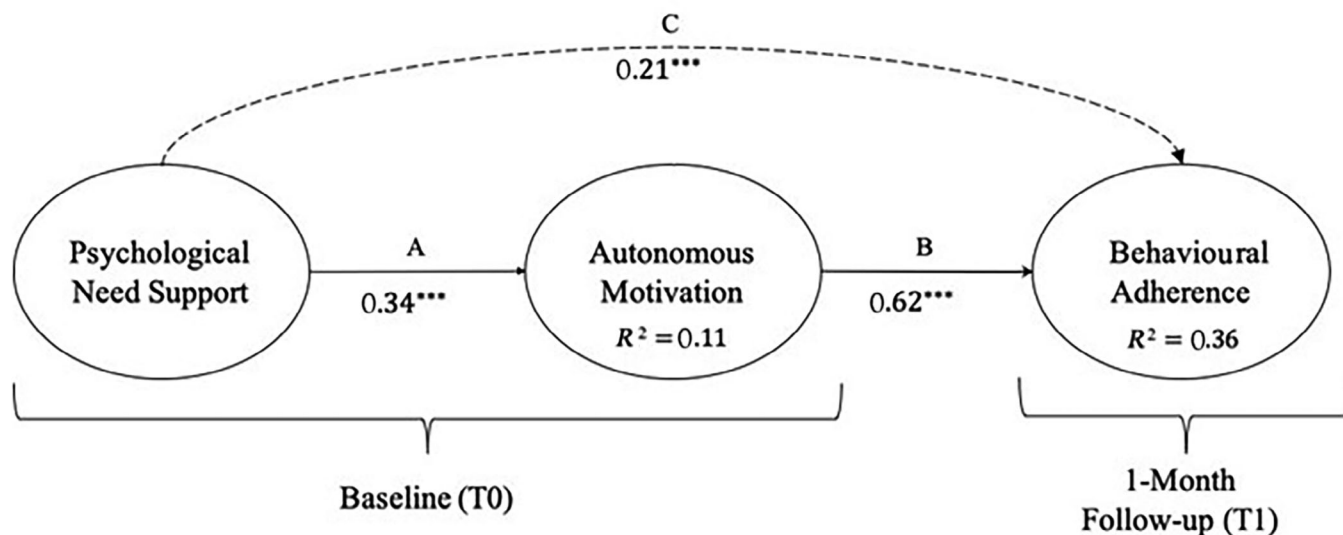
using the full-information maximum likelihood estimation method [30].

### 3 | Results

#### 3.1 | Preliminary Analysis

Descriptive statistics, zero-order intercorrelations and alpha coefficients for the study variables are presented in Table 1. In addition, the descriptive statistics of the subscales of behavioural adherence are shown in Appendix A (Supporting Information). As perceived severity, perceived vulnerability, number of new deaths from COVID-19 and the presence of lockdown were significantly correlated with the constructs in our proposed model, we included them as additional predictors in the model. Little's test [31] showed that missing data (3.20%) in the study were missing completely at random ( $p > 0.05$ ), justifying the use of a full-information maximum likelihood estimation method to impute missing values. Confirmatory factor analysis for the measurement model of psychological need support, autonomous motivation and behavioural adherence yielded acceptable goodness-of-fit values ( $\chi^2 = 381.40$  (df = 87), CFI = 0.94, TLI = 0.93, RMSEA = 0.07 [90% CI = 0.06–0.08], SRMR = 0.04), supporting the psychometric properties of the measures used in our study.





**FIGURE 1** | Self-determination model for behavioural adherence to COVID-19 prevention. The path estimates from the model are shown; \*\*\* $p < 0.001$ . The statistically significant and positive paths are shown by the black arrows (A and B). The indirect effect from psychological need support to behavioural adherence is shown by the dotted arrow (C).

**TABLE 2** | Parameter estimates for the proposed path model.

Paths	$\beta$	95% CI	$p$ value
H1: Psychological need support (T0) $\rightarrow$ Autonomous motivation (T0)	0.338	[0.279, 0.397]	<0.001
H2: Autonomous motivation (T0) $\rightarrow$ Behavioural adherence (T1)	0.620	[0.552, 0.688]	<0.001
H3: Psychological need support (T0) $\rightarrow$ Behavioural adherence (T1)	0.210	[0.158, 0.261]	<0.001

Abbreviations: 95% CI = 95% confidence intervals;  $\beta$  = standardised parameter estimate.

### 3.2 | Main Results

SEM revealed a good fit of our proposed model with the data (CFI = 0.94, TLI = 0.93, RMSEA = 0.06 [90% CI = 0.06–0.07] and SRMR = .05). We found support for our model hypotheses (Figure 1). Psychological need support at T0 was positively related to autonomous motivation at T0 (H1;  $\beta = 0.34$ ,  $p < 0.001$ ;  $R^2 = 0.11$ ), and autonomous motivation at T0 was positively related to behavioural adherence at T1 (H2;  $\beta = 0.62$ ,  $p < 0.001$ ;  $R^2 = 0.36$ ). It is worth noting that we found a positive indirect effect of psychological need support (T0) on adherence to COVID-19 preventive behaviours for children (T1) mediated by autonomous motivation (T0) (H3;  $\beta = 0.21$ ,  $p < 0.001$ ). The parameter estimates for the proposed model are presented in Table 2.

## 4 | Discussion

Parents are responsible for the prevention of COVID-19 infection in their children. Ensuring parent's adherence to these

behaviours is an important component of behavioural strategies to minimise the risk of infection in this group as well as control the spread of the infection in society [4, 5]. The development of effective intervention strategies to promote parental adherence to COVID-19 preventive behaviours for their children depends on identifying potentially modifiable determinants of such behaviour [6–8]. Psychological theory may play a crucial role, particularly theories of motivation. These results assist in identifying modifiable determinants that ultimately become targets for interventions to change behaviour in this context. The current prospective study applied self-determination theory [9, 10] which is a leading theory of human motivation to identify the determinants of parent's COVID-19 preventive behaviours for their children and the processes involved. Based on the theory and previous research, we proposed that parent's perceptions that their basic psychological needs are fulfilled tend to be associated with adherence to COVID-19 prevention for their children, mediated by autonomous motivation toward behaviours. The findings fully supported our proposed model with the direct effects of psychological need satisfaction and autonomous motivation on parent's adherence to COVID-19 preventive behaviours for their children, with an indirect effect of need support on adherence mediated by autonomous motivation.

### 4.1 | Motivation for COVID-19 Prevention

We found that autonomously motivated parents are more likely to adhere to COVID-19 preventive behaviours for their young children. This finding aligns with a key tenet of self-determination theory [9] regarding the adaptive role of autonomous motivation on behavioural adherence in health-related contexts [11, 12, 15–18]. According to the theory [9, 10], autonomously motivated individuals have strong personal agency and perceive the behaviour to serve self-endorsed goals. Our findings, therefore, suggest that parents of young children tend to persist with COVID-19 preventive behaviours when they have a clear, self-

endorsed rationale and personally relevant reasons for their actions. To speculate, this reflects that parents complied with COVID-19 preventive behaviours because they were afraid of the risks and consequences of testing positive for COVID-19 [32], penalties violating public health regulations (e.g., facemask use), or even being vilified or disapproved of by other parents who observed their noncompliance [33, 34]. It is important to note that many COVID-19 preventive strategies identified in the current study (e.g., disinfecting and cleaning the home and keeping the house well-ventilated) exclusively depend on parent's motivation and self-regulation. Given the key role of autonomous motivation in promoting long-term behavioural persistence in general [35], fostering autonomous motivation may be a crucial target for promoting parental commitment to COVID-19 preventive behaviours for their children.

## 4.2 | Psychological Need Support

Consistent with our proposed process model based on self-determination theory [9, 10] and prior studies [11, 12, 14, 15], we found that psychological need support was associated with parent's adherence to COVID-19 preventive behaviours mediated by autonomous motivation. This pattern of results suggests that parents seem to be autonomously motivated and adhere to COVID-19 preventive behaviours for their children when they perceive that their social environment supports their basic needs for autonomy, competence and relatedness with respect to these preventive behaviours [9, 10]. In contrast, failure to fulfil these basic needs may lead to lower motivation and compliance. The social environment in the context of COVID-19 may work against supporting parent's need satisfaction. For example, regulations and 'lockdown' orders could be considered impediments to foster parent's autonomy (e.g., enforcement of stay-at-home orders, requirements for facemasks on public transportation [36]), competence (e.g., shortage of personal protective equipment [37]) and relatedness (e.g., experiences of alienation or discrimination against facemask users [38]). The existing regulations and recommendations for COVID-19 are mainly presented using the command-and-control approach. For example, the presentation of these requirements in a controlling way, such as using controlling words and failing to provide a clear rationale or acknowledge feelings, are strategies that have been shown to thwart psychological needs and undermine autonomous motivation [39]. Therefore, there is a visible advantage to taking need satisfaction into account when presenting public health and media messages for the prevention of COVID-19 [6]. When developing these health messages, it is important to take an autonomy-supportive approach, which provides a personally relevant rationale and positive feedback, acknowledges feelings and outlines steps to ease people in managing and performing behaviours.

## 4.3 | Limitations and Future Directions

Current findings should be interpreted in light of the limitations of the study. Here, we outline limitations and implications and suggest future research directions. First, despite the evidence based on the validated scales used in the present study, the use of self-reported measures of behaviour and psychological variables may be subject to social desirability, reporting bias and

the confounding effects of common-method variance [40, 41]. Second, the prospective correlational design does not provide evidence regarding the causal effects of psychological need support and autonomous motivation on behaviour. Third, the period of data collection occurred when the vaccination for COVID-19 was unavailable, and the recommended preventive strategies for COVID-19 prevention were being constantly updated [4, 26–28]. Although we controlled for the potential confounding effects of key covariates, including perceived severity and vulnerability, the presence of stay-home orders and the number of confirmed cases and deaths, other unmeasured global and local factors related to the disease might affect our findings [20]. Future studies should address these limitations by introducing non-self-report measures of the target behaviour [42] and adopting a cross-lagged panel design [43]. This would provide evidence regarding the temporal order of the proposed effects [9, 10] and replicate the study in multiple samples and contexts to verify the consistency of these findings more broadly [44].

## 5 | Conclusion

The current study examined the predictions of a process model based on self-determination theory to identify the motivational factors related to parent's adherence to COVID-19 preventive behaviours for their young children. The findings underscored the relevance of motivational processes in future interventions and campaigns aiming to promote parent's behavioural adherence to COVID-19 preventive behaviours for their children. Governments and public health organisations should be aware of how to present messages in the autonomy-supportive approach to support parent's psychological needs and to foster their autonomous motivation to increase adherence to preventive behaviours for their children and contribute to minimising the spread of COVID-19.

### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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### Supporting Information

Additional supporting information can be found online in the Supporting Information section.