

Letter**Conspiracy Theories, Anti-Science, and Anti-Medicine in the COVID-19 Pandemic**

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During the pandemic of the COVID-19, conspiracy theories about vaccines and other issues were highlighted as a public health threat [1]. A small positive correlation between general attitudes towards science and general knowledge of scientific facts has been reported [2], higher vaccination coverage among the most educated and lower coverage among the least educated were reported globally for the COVID-19 vaccine [3]. In addition, a link between conspiracy theories and education has also been noted, with a large survey of 17 European countries reporting that individuals who expressed conspiracy beliefs had lower COVID-19 vaccine uptake, and that higher probability of believing in conspiracy theories was associated with lower levels of education [4]. On the other hand, contrary to these trends, a study reported that Doctorate were more hesitant to vaccinate when compared to those with a 4-year college degree, those with a master's degree, and those with a professional degree (e.g. MD, JD) [5]. Therefore, studies of vaccine hesitancy and conspiracy theories may need to consider not only social attributes, but also individual factors such as personality traits like the need for cognitive closure.

Other noteworthy points from the perspective of medical ethics include the fact that a certain number of mentally ill patients and other vulnerable members of

society are among those who believe in conspiracy theories and engage in vaccine avoidance and other behaviors. For example, it has been reported that those who believe in conspiracy theories were more likely to be socially vulnerable or meet criteria for mental illness, such as currently unmarried, less educated, in a lower income household, from an ethnic minority group, perceiving themselves as of lower social standing compared to others, lower levels of physical and psychological well-being, higher levels of suicidal ideation, weaker social networks, less secure attachment style, and difficult childhood family experiences [6]. Furthermore, paranoid personality disorder, schizotypal personality disorder, and narcissistic personality disorder have also been noted to have a high affinity with conspiracy theories [7], and indeed one study has shown that paranoia was linked to a reduction in vaccination adherence with the mediation effect of mistrust in medical science [8]. Thus, it is problematic that the conspiracy theory is leading the socially vulnerable and those in need of psychiatric treatment and care in an anti-scientific and anti-medical direction, preventing them from receiving the help they need. Not only will we have to deny those who believe in conspiracy theories, but we will also have to take their backgrounds into consideration so that we can deliver appropriate support.

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