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The still unexplored mediating role of vaccine literacy

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The recent meta-analysis published by Isonne et al.¹ on HV&I confirms the positive role of vaccine literacy (VL) to predict vaccine intention, as already shown by other reviews,^{2–4} while its association with vaccination status (vaccine uptake) is less significant. As pointed out by the authors, this could be linked, among others, to some aspects of convenience, including the accessibility and quality of vaccination clinics and the time and availability of people to be vaccinated.

The role of convenience, along with the other determinants of the ‘3Cs’ model,⁵ confidence and complacency, has been recently investigated by Lu et al.⁶ They have shown that these variables can mediate in the general population the relationship between VL and vaccine hesitancy (VH), accounting for 66% and 95% of the total effect of functional and interactive-critical VL, respectively. Using a VL single item nominal tool, Shon et al.⁷ have demonstrated the significant mediating effects of health beliefs (Health Belief Model’s perceived benefits, severity, and susceptibility) between flu VL and flu vaccination status in students, although the literacy of influenza vaccines also directly improved the vaccination behavior of individuals without any health-mediating effects of beliefs. Furthermore, using an 11-items tool derived from HLS-EU-Q47, including VL questions about immunization (e.g., “Understand why you need vaccinations”), Jiang et al.⁸ showed that the relationship between perceived health literacy (HL) and COVID-19 vaccine acceptance was completely mediated by attitudes toward general vaccination and self-efficacy of COVID-19 vaccine.

The path from determinants to vaccine acceptance has been illustrated by Hurstak et al.^{9,10} They have shown, in a selected population of urban adults using a functional HL tool (Touchscreen Technology – LiTT) and an adapted vaccine confidence scale, that HL mediated the relationship between some demographic variables and vaccine confidence, which in turn mediated the relationship between HL and COVID-19 vaccine acceptance. It is reasonable to assume that, similar to HL, VL can play a valuable role as mediator toward health outcomes.

According to the most recent definition,¹¹ which summarizes previous definitions, VL is the degree to which people have the capacity to obtain and understand information regarding vaccination and related services. It entails

‘knowledge,’ ‘motivation,’ and ‘competencies’ to access, understand, and critically appraise and apply information about immunization, vaccines, and vaccination programs, at personal, organizational, and community levels. Despite this definition is similar to that of HL, the two realms only partially overlap, as motivations about vaccines and vaccination are unique. Individuals with different levels of HL may also lack the necessary vaccination skills. In fact, the VL definition reflects its complexity and that of its underlying factors, including the fact that the elements in the motivation dimension are different from the other two dimensions, knowledge and competencies, which are not part of its psychological determinants.

Moreover, VL needs to be analyzed also as a relational concept: in fact, it can be considered as the balance between personal, community and population skills, and the complexity/demand of the context.¹¹ Within this perspective, the concepts of vaccine literate environment, organizational vaccine literacy, and vaccine literate healthcare organizations have to be explored in order to better understand the determinants of vaccination uptake or hesitancy.¹¹

The degree of association of VL with outcomes, such as vaccine uptake, which is weaker than its relationship with willingness to be vaccinated – as shown by the recent meta-analysis,¹ can also be explained by the definition itself which places VL at the center of a conceptual framework, as a valuable ‘tool’ that sits at the intersection between sociodemographic determinants and individuals’ attitudes, which are closer and more directly influencing behaviors and outcomes, such as vaccine uptake. This concept can help explain why VL can play a crucial role as a driver to enable individuals to make informed decisions about disease prevention and health promotion.

We agree, as underlined by others,^{1,2} that more studies are needed to clarify the influence of VL on the actual uptake of vaccination, possibly using observational designs more than cross-sectional studies, and through the development and validation of more comprehensive assessment tools to be used in different populations. However, future research should also be directed to better explore the positioning of VL among other relevant variables leading to health outcomes and its mediating role between them, for which current tools can probably also be used by adapting and selecting items through factor analysis

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techniques and reliability processes, based on previous experience, and sharing data between research groups. In these perspectives, analyzing the community and organizational levels (i.e. the VL environment and the organizational VL) can contribute to complete the interactions of such complex dynamics. Understanding the influence of VL can help develop effective strategies to address VH and promote positive vaccine-related behaviors.

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L.R.B. drafted the letter; C.L. P.Z, and G.B. revised it.

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