Study Protocol

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Boredom and Health Literacy in Adolescents and Their Parents During Acute Hospitalization: Protocol for a Monocentric Observational Study

Citation: Maiandi S, Zavadina I, Mondini S, Baldo A, Busca E, Sciglitano S, Guerreschi D, Scognamiglio D, Ghizzardi G, Aloi E. "Boredom and Health Literacy in Adolescents and Their Parents During Acute Hospitalization: Protocol for a Monocentric Observational Study" (2026) *Interdisciplinary Journal of Nursing and Health* 5(2): 92-99. DOI: https://doi.org/10.82051/ijnh-2026-262

Disciplines: Nursing, Pediatrics, Public Health

Received: December 20, 2025

Revised: March 26, 2026

Just accepted online: June 11, 2026

Published: June 11, 2026

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Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Conflict of Interest: The author(s) declare(s) no conflict of interest.

Funding: This research received no external funding.

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Abstract

Introduction. Adolescence is a critical developmental period characterised by profound physical, psychological, and social changes. Hospitalisation for acute illness may increase adolescents' vulnerability, particularly when care pathways are not tailored to their specific needs. Among the emotional experiences reported during hospital stays, boredom has emerged as a frequent yet understudied phenomenon in adolescents. At the same time, hospitalisation may represent an opportunity to enhance health literacy, a key competence influencing adolescents' current and future health behaviours. Understanding the relationship between boredom and health literacy may support the development of patient-centred interventions aimed at improving the hospital experience.
Methods. This is a single-centre, cross-sectional observational study conducted in the paediatric ward of Lodi Hospital (Italy). Adolescents aged 12–17 years hospitalised for acute medical or surgical conditions and one accompanying parent will be consecutively enrolled. Adolescent boredom will be assessed daily using the Multidimensional State Boredom Scale – Italian Adolescent Version, while parental boredom will be measured using the adult version of the same scale. Health literacy will

be evaluated on the first day of hospitalisation using the Health Literacy for School-Aged Children (HLSAC) scale. Descriptive and inferential statistical analyses will be performed to explore predictors and associations.
Results. The study is expected to provide the first quantitative evidence on boredom levels among hospitalised adolescents and their parents, as well as adolescents' health literacy levels. Associations between boredom, health literacy, and contextual factors may emerge, identifying subgroups at higher risk.
Discussion. Findings will contribute to a better understanding of the adolescent hospital experience and inform the development of targeted interventions to improve emotional well-being, engagement, and quality of care in paediatric settings.

Keywords: Adolescent, Hospitalization, Boredom, Health Literacy, Pediatrics

Introduction

Adolescence is the period of life most strongly characterised by intense and significant physical and psychological transformations, often accompanied by changes in social interactions and relationships, in which somatic and psychic development proceed along different pathways and at various speeds (Massimo et al., 2016). Although defining adolescence chronologically is complex, this developmental stage is generally considered to include individuals between 12 and 19 years of age (Alderman et al., 2019; Liuzzi et al., 2023; Tetteh-Quarshie & Risher, 2022).

Adolescents aged 10–17 years account for approximately 12% of all pediatric hospitalisations (Puntoni et al., 2025; Weiss et al., 2006) and, despite the relevance of hospital admissions in this age group, evidence on adolescents' hospital experience remains limited outside psychiatric settings, and acute admissions are comparatively underexplored in the literature compared with chronic conditions (Kirwan et al., 2025; Maiandi et al., 2026).

Hospitalisation places adolescents in a condition of particular vulnerability, especially when care pathways are not built around their real needs and expectations (Hybschmann et al., 2024). Among the various emotions and sensations adolescents experience, literature indicates that boredom is emerging as a frequently reported emotion among older adolescents during hospitalisation (Maiandi et al., 2024); however, to date, no shared definition of boredom exists, particularly in the healthcare context (Zavadina et al., 2025). Recent evidence from adolescents' acute hospital journeys further suggests that boredom may represent a distinctive and clinically relevant feature of hospitalisation for this age group (Maiandi et al., 2026).

Studying this emotion poses a challenge for scientific research due to its complexity and temporal fluctuations (Spaeth et al., 2015), and identifying this emerging characteristic is also essential for designing preventive actions that may significantly improve the patient experience (Ceylan et al., 2022). Specifically, collecting the perspectives of young users enables the identification of priorities and care pathway elements that are not typically investigated, thereby involving them in the development of a high-quality healthcare system (Nordlind et al., 2022). Patients, in fact, are the only actors who experience the entire care trajectory, moving through each phase according to their own perspective and emotional experience (Ben-Tovim et al., 2008; Samaranayake et al., 2016; Trbovich & Vincent, 2019). The lived experience of the hospitalised adolescent also reveals when and why a positive or negative interaction occurs during the care process, helping to identify areas for improvement or strengths within a patient-centred perspective (Larson et al., 2019).

Importantly, beyond being an unpleasant emotional state, boredom may have functional implications for adolescents' participation in care. Contemporary

models conceptualise boredom as an affective signal of unsuccessful attentional and cognitive engagement with ongoing activity (Westgate & Wilson, 2018). Empirical evidence in adolescents links higher boredom to lower motivation and reduced self-regulation/engagement, suggesting that boredom may undermine the sustained attention and effort required to process information and remain involved (Vuyk et al., 2024). In hospital settings, this could translate into lower involvement in conversations about care, reduced attention to explanations, and less proactive help-seeking—mechanisms through which boredom could plausibly interfere with the ability to understand and use health information.

Improving the adolescent experience also means enhancing individual health literacy skills, defined as the ability to access, understand, evaluate, and use health information to make informed decisions in the health domain. (Fleary et al., 2018; Schulenkorf et al., 2022). In adolescents, this competence is particularly relevant, as the way they understand and manage health information today will influence their future health behaviours. Health literacy is not limited to merely comprehending medical terms or prescriptions, but also involves navigating the healthcare system, communicating effectively with professionals, and making autonomous and responsible decisions to transform hospitalisation from a merely time of care to a structured opportunity to promote higher levels of health literacy, transforming a potentially passive condition into an experience of informed and conscious participation (Fleary et al., 2018).

In the healthcare setting, adolescent health literacy has been framed as a set of skills used to organise and apply health-related knowledge and practices within real-world care contexts, emphasising the need for engagement with information and interactions with professionals (Massey et al., 2012). Therefore, if boredom reduces engagement and motivation, it may represent a contextual barrier to health literacy–related processes during acute hospitalisation—an association that remains insufficiently examined.

Furthermore, parents play a pivotal role in the hospitalisation of adolescents; in fact, if parents experience boredom, this may negatively impact their ability to engage and positively stimulate their children. Parents who frequently experience boredom may be less inclined to actively participate in family activities and provide a stimulating and supportive environment, thereby increasing the risk of dysfunctional behaviours in adolescents (Alderman et al., 2019). Bored parents may transmit negative behavioural models to their children by demonstrating a lack of interest in constructive or creative activities (Vargas-Rubilar et al., 2023; Vega-Díaz et al., 2023). Within the hospital context, reduced parental engagement could plausibly affect adolescents' experience by lowering emotional support, decreasing constructive co-occupation, and limiting parents' facilitation of adolescents' involvement in care discussions and information processing.

Taken together, the literature suggests a clinically meaningful but underexplored pathway in acutely hospitalised adolescents: boredom may reduce engagement (attention, motivation, participation in care), which may in turn hinder health literacy–related processes in the hospital setting (Westgate & Wilson, 2018; Massey et al., 2012; Vuyk et al., 2024). Clarifying this gap is important to determine whether hospitalisation can realistically be leveraged as an opportunity to support adolescents' informed participation, or whether boredom represents a barrier that should be addressed through targeted, developmentally appropriate interventions.

The primary objective of this study is to describe levels of boredom and health literacy among adolescents hospitalised for acute illness. The secondary objective is to describe levels of boredom among parents accompanying adolescents during hospitalisation. In addition, the study aims to explore the association between adolescents' boredom and health literacy during hospitalisation, consistent with the proposed conceptual pathway linking boredom-related disengagement with health information use.

Methods and Materials

Study design

This is a single-centre, longitudinal observational study with consecutive enrolment of a convenience sample of adolescents hospitalised for acute illness and their parents.

Study setting and timeline

The study will be conducted in the paediatric ward of Lodi Hospital, Lombardy, Italy. Recruitment will last approximately 12 months.

Participants: inclusion/exclusion criteria

Adolescents will be enrolled after obtaining written consent from their parents or legal guardians to participate in the study. Parents will also participate only after providing written consent. Adolescents aged 12 years and 364 days to 17 years, hospitalised for acute medical (e.g., acute infections, respiratory diseases such as pneumonia or asthma exacerbations, gastrointestinal disorders such as acute gastroenteritis, dehydration, acute abdominal pain of medical origin, urinary tract infections) or surgical conditions (appendectomy, fractures requiring surgical intervention, abdominal or urological surgery), and with one parent continuously present throughout the hospital stay, will be included. Adolescents and parents who are unable to understand Italian or have inadequate comprehension to complete the questionnaire will be excluded. Adolescents without a parent during hospitalisation will also be excluded.

Study procedure

The researcher will inform eligible participants before enrollment and provide them with the following documents: an information sheet and consent form for adolescents, an information sheet and consent form for parents, and a personal data processing form. These documents must be signed by both the adolescent and the parent after careful reading and understanding of the study objectives and procedures. Participants will receive a paper booklet (one for the adolescent and one for the parent) at the end of the first day of hospitalisation. They will be asked to complete one questionnaire per day, in the evening, throughout the hospital stay. Daily completion time is approximately 15 minutes. Each booklet contains six questionnaires; if hospitalisation exceeds six days, an additional booklet will be provided. Completed booklets will be returned to the researcher upon discharge in an anonymous, sealed envelope. The health literacy questionnaire will be completed once on the first day of hospitalisation.

Measures

- Adolescent socio-demographic variables: data will be collected on age, gender, previous hospitalizations, previous hospitalizations during the current year, family composition, presence of siblings in the household, availability and type of electronic devices and the possibility of exclusive use during hospitalisation, use of social media and technology, presence of scheduled entertainment activities during the hospital stay, and the need to continue school and study activities during hospitalisation.
- Parent socio-demographic variables: data will be collected on age, gender, occupation, availability and type of electronic devices and the possibility of exclusive use during the hospital stay, use of social media and technology, presence of scheduled entertainment activities during the hospital stay, and the need to continue work activities during hospitalisation.
- Adolescent Health literacy: this variable will be assessed using the Health Literacy for School-Aged Children (HLSAC) scale, validated in Italian (Velasco et al., 2021). The HLSAC is theoretically grounded in five core components: theoretical knowledge, practical knowledge, critical thinking, self-awareness, and citizenship. However, the Italian validation study supported a one-factor solution as the preferred factorial structure, indicating that the scale can be appropriately interpreted as measuring a single underlying construct of health literacy. Each statement is rated on a Likert scale, where participants indicate their level of agreement with the statement. The Italian version of the HLSAC has demonstrated good psychometric properties, including adequate construct validity and good internal consistency (McDonald's $\omega = 0.80$), supporting its reliability for measuring health literacy among adolescents. Health literacy levels will be classified according to the total score obtained: a score between 10 and 25 indicates low health literacy, a score between 26 and 35 indicates moderate health literacy, and a score between 36 and 40 indicates high health literacy. The overall score will be calculated by summing the responses to the ten items of the scale. The principal investigator requested and obtained

authorisation from the authors to use the scale, which had been validated in Italian.

- Adolescent boredom: This variable will be assessed using the Multidimensional State Boredom Scale (MSBS) – Italian Adolescent Version (Spoto et al., 2021). The scale consists of 23 items rated on a 7-point Likert scale (from 1 = strongly disagree to 7 = strongly agree). The Italian adolescent validation study confirmed the factorial validity of the instrument and reported good internal consistency, with McDonald's ω = 0.90 for the total score and values ranging from 0.72 to 0.92 across subscales, supporting its reliability for assessing boredom in adolescents. A total score of 88 is considered the cut-off for identifying individuals at potential risk of boredom. The researcher requested and obtained authorisation from the authors to use the Italian version of the scale, which had been validated.
- Parental boredom: this variable will be assessed using the Multidimensional State Boredom Scale (MSBS) (Craparo et al., 2017). The scale consists of 29 items that cumulatively evaluate an individual's experience of boredom, using a 7-point Likert scale (from 1 = strongly disagree to 7 = strongly agree). The scores obtained across the five factors are combined to produce an overall boredom score. The Multidimensional State Boredom Scale (MSBS) does not define a standard cut-off to indicate boredom, as it measures levels of boredom across multiple dimensions (such as inactivity and lack of stimulation) rather than establishing a single threshold. However, higher scores indicate greater perceived boredom, although any specific cut-off may vary depending on the context or sample characteristics (Fahlman et al., 2013). The Italian validation of the MSBS demonstrated strong psychometric properties, including a Cronbach's alpha of 0.95 for the total scale and values between 0.80 and 0.89 for the subscales, indicating high internal consistency and good reliability. The principal investigator requested and obtained authorisation from the authors to use the Italian version of the scale, which had been validated.

Data collection: quality management and storage

Researchers will collect data during hospitalisation; no further follow-up is planned. All study data will be initially recorded on paper (in the form of questionnaires) and subsequently uploaded electronically. Each dataset will be assigned a unique study code to prevent participant identification and will be securely stored. Only the principal investigator will have access to the data sources.

Analyses

Descriptive statistics will be presented as frequencies and percentages for categorical variables. For continuous variables, central tendency will be calculated using means and standard deviations for normally distributed variables (Kolmogorov–Smirnov test with sample size n > 100), and medians with interquartile ranges (IQR) for non-normally distributed variables.

Categorical variables will be compared using the chi-square test and Fisher's exact test when appropriate; Bonferroni correction will be applied when necessary.

Health literacy will be analysed both as a continuous variable (total HLSAC score) and as a categorical variable (low, moderate, and high levels) according to the classification provided by the scale.

Adolescent boredom will be assessed daily during hospitalization using the MSBS scale. For the primary analyses, a mean boredom score across the hospitalization period will be calculated for each participant to obtain a single summary measure of individual boredom levels.

To explore predictors of adolescent boredom, multivariable regression analyses will be performed using the mean boredom score as the dependent variable. Potential predictors will include adolescent socio-demographic variables, parental characteristics, and health literacy.

Continuous variables will be compared using univariate ANOVA for normally distributed data and the non-parametric Mann–Whitney U test for non-normally distributed data. The Wald test will be used, when indicated, for categorical variables with more than two levels.

Given that boredom is assessed daily during hospitalization, additional analyses using linear

mixed-effects models will be conducted to account for the longitudinal structure of the data and the within-subject correlation of repeated measures over time.

A p-value < 0.05 will be considered statistically significant. All statistical analyses will be performed using IBM SPSS Statistics software (version 29.0.2.0).

Sample size

The sample size was calculated to obtain an accurate estimate of boredom levels in adolescents using the Multidimensional State Boredom Scale (MSBS) – Italian Adolescent Version (Spoto et al., 2021). Since the study aims to describe the level and characteristics of boredom in adolescents, the sample size was estimated based on the desired precision of the estimated mean MSBS score. The formula used to determine the minimum number of participants required was:

$n = (Z \cdot \sigma / E)^2$ where $Z = 1.96$, the critical value of the standard normal distribution for a 95% confidence interval; $\sigma = 23.6$, the standard deviation estimated from previous validation studies of the MSBS in Italian adolescents; and E = the acceptable margin of error, meaning the maximum difference between the sample mean score and the expected population mean.

Accepting a margin of error of ±3 points, the required sample size is 238 adolescents.

Ethical considerations

The Lombardia 1 Ethics Committee approved the study protocol (Experiment Registry No. 69-2025). Researchers will provide adolescents and parents with all relevant study information. Adolescents and parents may withdraw from the study at any time. Results may be presented at conferences and will be published in peer-reviewed journals.

Excpected Results

The study is expected to generate the first quantitative evidence on the presence, intensity, and characteristics of boredom among adolescents hospitalised for acute conditions and their parents. The analysis of daily patterns of boredom, combined with socio-demographic variables and contextual factors, will allow the identification of specific moments or conditions of hospitalisation in which boredom is more likely to emerge. In parallel, assessing health literacy levels will provide a clearer understanding of adolescents' ability to access, interpret, and utilise health information during hospitalisation.

By integrating these two dimensions, boredom and health literacy, the study is expected to reveal potential associations that may inform future research and guide the development of interventions aimed at improving patient engagement and emotional well-being. The results may also highlight subgroups at greater risk of experiencing high levels of boredom or low health literacy, supporting the design of targeted strategies within paediatric settings. Ultimately, the findings will contribute to building a more nuanced and evidence-based understanding of the adolescent hospital experience, offering essential insights for enhancing care quality and informing organisational improvements.

Conclusion

This study aims to describe boredom in adolescents systematically hospitalised for acute conditions and their parents, as well as their levels of health literacy. By utilising validated instruments and a structured data collection process, the project aims to address a significant knowledge gap regarding a phenomenon that is understudied yet potentially influential on the patient experience. The expected results will provide evidence to guide targeted interventions aimed at improving the quality of care, enhancing the value of hospital stay, and promoting the active and informed engagement of adolescents and their families.

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