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Associations Among Teacher-Reported School, Communication, and Behavioral Difficulties in Students With Chronic Illness

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Abstract

Students with chronic illness may experience school, communication, and behavioral difficulties. This study examined associations among these three categories of teacher-reported difficulties in Slovak lower-secondary schools. A secondary analysis of cross-sectional survey data from 403 teachers was conducted. Associations were assessed using Pearson's chi-square test, odds ratios (ORs), 95% confidence intervals (CIs), and phi coefficients, with Holm's correction for multiple comparisons. School difficulties were reported by 37.5% of teachers, communication difficulties by 22.3%, and behavioral difficulties by 18.9%. Positive associations were found between school and communication difficulties (OR = 5.21; 95% CI, 3.14–8.64), school and behavioral difficulties (OR = 4.99; 95% CI, 2.91–8.55), and communication and behavioral difficulties (OR = 3.64; 95% CI, 2.13–6.21). All associations remained statistically significant after Holm adjustment (adjusted $p < .001$). Implications for School Health Policy, Practice, and Equity: The findings support a comprehensive assessment of educational needs and coordinated school support that addresses academic, communication, and behavioral concerns. The categories of difficulties reported by teachers were significantly associated. The findings do not establish causal relationships or confirm the co-occurrence of difficulties in individual students.

Keywords: chronic illness; school health; teachers; school difficulties; communication difficulties; behavioral difficulties.

1. INTRODUCTION

Chronic illnesses in childhood and adolescence represent a significant factor influencing educational conditions, daily school functioning, and the psychosocial development of students. Their consequences are not limited to health problems and the need for treatment but can also affect regular school attendance, academic learning, meeting educational requirements, peer relationships, and communication with teachers. Although individual chronic illnesses differ in their course, symptoms, and treatment requirements, their impacts on school life may share common characteristics. Research therefore highlights the need to move beyond a narrowly diagnostic approach and to assess the educational situation of these students within the broader context of their individual functioning and social environment in several complementary strands of research. Alsaggaf and Coyne [1] examine chronic pain and school functioning, whereas Glinianaia et al. [2] synthesize educational outcomes and needs associated with selected congenital anomalies. Harčaríková et al. [3] consider school problems and educational support in the Slovak context. Jay et al. [4] examine absence, exclusion, and non-enrolment using linked education and health records.

The significance of this issue is confirmed by extensive international research syntheses. Jay et al. [5] analyzed 27 systematic reviews encompassing 441 unique studies with data on more than 7.5 million children from 47 geographic regions. The results showed that a number of chronic health conditions are associated with lower educational outcomes, although the nature and intensity of these associations vary across diagnostic groups. The authors also focused on the assumption that the relationship between chronic illness and lower academic achievement can be explained by increased absenteeism. Although this interpretation is widespread in the professional literature, only a limited number of the included studies directly assessed the mediating role of school absenteeism, and the available evidence did not convincingly confirm its mediating effect. These findings suggest that the academic difficulties of students with chronic illnesses cannot be explained solely by intermittent attendance. Fatigue, pain, sleep disturbances, treatment-related limitations, specific cognitive consequences of certain illnesses, and conditions of the educational environment may also play a role. The relationships between chronic health conditions, school attendance, and other forms of educational engagement are also supported by population-based research [4].

A qualitative synthesis [6], which included 35 studies from 15 countries focusing on adolescents aged 11 to 18 with chronic somatic illnesses, contributes to a broader understanding of these students' school experiences. The authors identified six interrelated areas of school life, including coping with educational demands and missed coursework, identity formation, peer relationships, experiences of difference, autonomy, and relationships with school staff. Their findings show that educational outcomes and school attendance represent only part of the experiences of students with chronic illnesses. To understand their needs, it is essential to also pay attention to their subjective experience of school situations, opportunities for active participation in education, and the quality of their social relationships.

At the same time, these findings highlight the importance of diverse perspectives when assessing school functioning. Research focused on the students' own experiences allows us to understand their perceptions and individual needs, while pedagogical assessments provide a different perspective on the challenges identified in everyday educational practice. Educators may document problems related to learning, communication, and behavior; however, their accounts also reflect a subjective interpretation of school situations. Distinguishing between the student's and the teacher's perspectives is therefore important not only for planning support but also for a methodologically accurate interpretation of research data.

A significant area of school functioning involves difficulties related to learning, attention, and academic performance. For students with chronic illnesses, these difficulties may be associated with fluctuations in health status, increased fatigue, pain, medical treatments, or disruptions in the continuity of education. A systematic review [1] focusing on chronic pain and school functioning among adolescents highlights the complex nature of these relationships and the importance of school staff responses. A systematic review and meta-analysis [2] draws attention to differences in educational outcomes and the needs of children born with selected congenital anomalies. The findings of these studies cannot be generalized without further analysis to all groups of chronic conditions; however, together they demonstrate the need to assess educational challenges in light of specific health and school circumstances. At the same time, it is essential to distinguish between reduced academic performance and clinically diagnosed cognitive disorders, as problems with concentration or mastering course material can arise under various conditions.

In addition to academic performance, communication and social participation are important aspects of school adjustment. Communication difficulties among students with chronic illnesses do not necessarily correspond to a clinically defined speech or language disorder. They may include uncertainty in communicating health needs, difficulties in explaining individual limitations, fears of peer reactions, or barriers to communication with teachers. James et al. [7] highlight the links between adolescents' chronic health conditions and school disconnectedness. This perspective is further expanded by findings on school belonging and the return to education of hospitalized students with chronic or complex health conditions [8]. The importance of social functioning is further demonstrated by a systematic review focusing on peer relationships and the social experiences of adolescents with chronic pain [9]. Although these studies focus on different populations

and aspects of school life, they collectively support the need to pay attention to communication, relationships, and social inclusion in addition to academic outcomes themselves. In addition to academic difficulties, it is essential to pay attention to the social-emotional aspects of school functioning. A study focusing on the implementation of the Resilience, Rights, and Respectful Relationships (RRRR) methodology in Czech schools highlighted the benefits of systematic support for social-emotional competencies in terms of classroom relationships, empathy, cooperation, and students' emotional regulation [10]. These findings underscore the importance of a supportive school environment and provide a broader context for examining the communication and behavioral difficulties that educators observe when teaching students with chronic illnesses.

Another area involves behavioral difficulties, the identification and interpretation of which require special caution. A student's behavior may be influenced by the burden of illness, psychological experiences, social experiences, and the demands of the school environment. Manifestations of irritability, passivity, avoidance of certain activities, or limited cooperation therefore cannot automatically be considered disciplinary problems or a direct consequence of a chronic illness. In an educational context, it is important to distinguish between observed behavior and the interpretation of its causes. In their systematic review, Efthymiou et al. [11] focused on school-based behavioral interventions and the conditions for the inclusion of children with chronic illnesses. Their work provides a context for considering the interconnection of educational, psychosocial, and organizational measures. For research on school functioning, it is therefore important not to view school-related, communication, and behavioral difficulties as entirely isolated areas, but to also examine their potential interconnections.

The need for a more precise assessment of educational needs is also confirmed by findings on the effectiveness of support measures. A systematic review by Barnett et al. evaluated educational support services designed for children and adolescents with chronic health conditions [12]. The available randomized controlled trials did not provide sufficiently reliable evidence as to whether the interventions under study improve school engagement, educational outcomes, or return to school. The authors therefore highlighted the need for higher-quality studies to determine which forms of support are appropriate for different groups of students and under what conditions they may be effective. A more precise characterization of the difficulties identified in the school setting may serve as a prerequisite for more targeted planning and subsequent evaluation of support; however, it does not in itself prove the effectiveness of specific measures.

At the same time, it is essential in educational research to distinguish between clinically diagnosed disorders and difficulties identified based on educators' experiences. Questionnaire-based evaluation may capture manifestations that teachers observe when educating students with chronic illnesses, without allowing for the determination of their clinical nature or causes. It is equally important to distinguish between the prevalence of individual categories of difficulties and their statistical associations with one another. Information on how often educators report a particular category does not, in and of itself, indicate whether reporting that category is associated with reporting other categories.

Existing research provides extensive insights into the associations between chronic health conditions and educational outcomes, school attendance, social participation, and the psychosocial functioning of children and adolescents [5–7, 11]. However, the mutual associations among the categories of school-related, communication, and behavioral difficulties reported by teachers represent a distinct analytical question. Assessing these associations can supplement existing knowledge about how various areas of school functioning are reflected in teachers' reports. Such findings may be relevant for the comprehensive identification of educational needs; however, they must not be confused with evidence of co-occurring difficulties in specific students. Effective support for students with chronic illnesses requires not only an individualized approach to their educational needs but also adequate professional preparedness on the part of teachers and the creation of an inclusive school environment. Research involving bachelor's-level teacher education students has highlighted time constraints and inadequate employer support as barriers to participation in teacher education [13]. This evidence concerns access to professional preparation rather than the effectiveness of support for students with chronic illnesses. Lum et al. [14] compared parent-reported school needs and support among students with and without chronic illness, identifying unmet academic, social, and emotional needs. Their findings relate directly to the educational support required by this population, although they reflect parents' reports rather than teachers' accounts. Together, these studies provide complementary perspectives on professional preparation and the need to align school support with students' individual circumstances.

The present study builds upon dissertation research [15], selected results of which were also published in an earlier article [3]. The original research focused on identifying school-related challenges faced by students with chronic illnesses and options for their special education support. The current study draws exclusively on the quantitative component of the original research and presents a secondary statistical analysis of questionnaire data from 403 teachers working at the lower-secondary level (upper grades of elementary school) in Slovakia. Its aim is to assess the strength and statistical significance of associations between school-related and communication difficulties, school-related and behavioral difficulties, and communication and behavioral difficulties. Unlike the original comparison of frequencies, the current analysis focuses on the relationships between the categories of difficulties reported by respondents. The chosen approach allows for the

characterization of statistical associations at the level of teachers' responses, rather than demonstrating causal relationships or directly assessing the co-occurrence of difficulties among individual students.

2. METHODS

2.1. PARTICIPANTS

The research sample consisted of 403 teachers working at the lower-secondary level (upper grades of elementary school) in the Slovak Republic who participated in the original questionnaire survey conducted as part of a doctoral dissertation [15]. Of the total number of respondents, 391 teachers (97.0%) worked in regular elementary schools and 12 teachers (3.0%) in elementary schools attached to healthcare facilities.

The largest age group consisted of teachers aged 35 to 55 (n = 267; 66.3%). They were followed by respondents aged 25 to 35 (n = 68; 16.9%) and 55 to 64 (n = 63; 15.6%). One respondent (0.2%) was under 25, and four respondents (1.0%) were 64 or older.

A total of 364 teachers (90.3%) reported having prior experience teaching at least one student with a chronic illness, while 39 respondents (9.7%) did not report such experience. The unit of observation is the teacher as a respondent to the questionnaire survey. Therefore, the research sample cannot be interpreted as a sample of individual students with chronic illnesses.

2.2. QUESTIONNAIRE AND VARIABLES

To collect data in the original study, a non-standardized questionnaire of our own design was used, developed on the basis of theoretical knowledge and expert consultations. The questionnaire was intended for teachers in the upper grades of regular elementary schools and elementary schools affiliated with healthcare facilities. It contained 19 items, 18 of which were mandatory. Eleven items were closed-ended, and eight allowed for open-ended responses [15].

For the present secondary analysis, three items focusing on the difficulties that teachers associated with educating students with chronic illnesses were used. Item 13 assessed school-related problems, item 14 assessed communication problems, and item 15 assessed behavioral problems. All three items were formulated as open-ended questions in which respondents were asked to indicate whether they had encountered the relevant type of problem and, if so, to describe it in detail.

In the original study, the respondents' verbal responses were analyzed for content and subsequently converted into dichotomous categories indicating whether or not the relevant type of difficulty was reported. For the present analysis, three binary variables were thus defined: school-related difficulties, communication difficulties, and behavioral difficulties. The term "behavioral difficulties" is used in this study as a terminological equivalent of the original category of "behavioral problems." Throughout this analysis, "school-related difficulties" denotes the same survey category previously described as academic difficulties; it is not a separate measured variable.

Since the research instrument was not standardized, the variables under study represent subjective pedagogical reports of observed difficulties. These are neither clinical diagnoses nor the results of standardized psychometric assessments. The interpretation of the identified associations is therefore limited to the relationships between the categories of difficulties recorded in the respondents' answers.

2.3. STUDY DESIGN AND ETHICS

The study was designed as a secondary quantitative analysis of data obtained through a cross-sectional questionnaire survey conducted as part of a dissertation research project [15]. The original research focused on identifying school-related problems among students with chronic illnesses and options for their special education support. The present study uses exclusively quantitative data from the questionnaire section of the original research.

The original questionnaire survey was conducted among teachers at the lower-secondary level (upper grades of elementary school) in Slovakia. For the purposes of the current analysis, summary frequencies of responses relating to three selected categories of difficulties were used. The secondary analysis did not require new data collection or further involvement of respondents.

Unlike the original evaluation, which focused primarily on the frequencies of individual categories of difficulties and their pairwise comparisons, the current study focuses on the strength and statistical significance of associations between the categories reported by teachers. Three pairs of variables were analyzed: school-related and communication difficulties, school-related and behavioral difficulties, and communication and behavioral difficulties.

According to confirmation from the research team, the original dissertation research was approved by the relevant ethics committee. The current study represents a secondary analysis of aggregated data and did not require new data collection or further contact with respondents.

2.4. STATISTICAL ANALYSIS

The statistical analysis focused on assessing the associations between three dichotomous variables representing school-related, communication, and behavioral difficulties reported by teachers in connection with the education of students with chronic illnesses.

The secondary analysis was based on the frequencies reported in the contingency tables from the original dissertation research. For each pair of variables, a 2×2 contingency table was constructed to capture the combinations of the presence and absence of both categories of difficulties. The analysis was based on the aggregate frequencies of 403 respondents.

Pearson's chi-square test of independence was used to assess the statistical association between pairs of categorical variables. The magnitude and direction of the association were expressed using the odds ratio (OR) and its 95% confidence interval (CI). The ϕ (phi) coefficient was used as a supplementary measure of the magnitude of the association. OR values greater than 1 were interpreted as indicating higher odds of reporting one category of difficulties among respondents who also reported the other category. Confidence intervals were calculated using the Wald method.

All statistical tests were two-sided. Given the three predefined pairwise comparisons, Holm's correction for multiple testing was used to assess statistical significance at an overall significance level of $\alpha = 0.05$. This procedure allows for controlling the overall probability of a Type I error when testing multiple hypotheses simultaneously [16]. In addition to the adjusted p-values, emphasis was placed primarily on the magnitude of the estimated associations and their confidence intervals.

The analysis was based on aggregated data from the original survey. Without individual respondent records, it was not possible to perform multivariate modeling, account for potential clustering of respondents within individual schools, or assess the influence of other teacher characteristics. The results are therefore interpreted as unadjusted pairwise associations between the categories of difficulties reported by respondents, rather than as causal relationships or individual risks among students.

3. RESULTS

Of the total of 403 teachers, 151 respondents (37.5%) reported school-related difficulties among students with chronic illnesses, 90 respondents (22.3%) reported communication difficulties, and 76 respondents (18.9%) reported behavioral difficulties. The analysis focused on assessing the mutual associations between these three categories of difficulties based on the teachers' responses. The results of individual pairwise comparisons are presented in Table 1.

Table 1. *Associations Between Teacher-Reported Difficulty Categories (N = 403)*

Difficulty Categories	Both Reported, n (%)	OR (95% CI)	$\chi^2(1)$	ϕ	Adjusted p
School × Communication	61 (15.1)	5.21 (3.14–8.64)	45.43	0.336	$< .001$
School × Behavioral	52 (12.9)	4.99 (2.91–8.55)	38.30	0.308	$< .001$
Communication × Behavioral	33 (8.2)	3.64 (2.13–6.21)	24.02	0.244	$< .001$

N = 403 teacher respondents. OR = odds ratio; CI = confidence interval; χ^2 = Pearson chi-square statistic; ϕ = phi coefficient. Adjusted p values were calculated using Holm's sequential procedure for three comparisons. The 95% confidence intervals are unadjusted Wald intervals. "Both reported" indicates respondents who reported both categories of difficulties within the respective pair.

Sixty-one teachers (15.1%) reported both school-related and communication difficulties, 52 teachers (12.9%) reported both school-related and behavioral difficulties, and 33 teachers (8.2%) reported both communication and behavioral difficulties. The highest odds ratio was found between school-related and communication difficulties (OR = 5.21; 95% CI: 3.14–8.64; $\chi^2(1) = 45.43$; $\phi = 0.336$; $p < 0.001$). Teachers who reported school-related difficulties had approximately 5.2 times the odds of also reporting communication difficulties compared with teachers who did not report school-related difficulties.

A statistically significant positive association was also observed between school-related and behavioral difficulties (OR = 4.99; 95% CI: 2.91–8.55; $\chi^2(1) = 38.30$; $\phi = 0.308$; $p < 0.001$). Teachers who reported school-related difficulties had approximately five times the odds of also reporting behavioral difficulties compared with respondents who did not report school-related difficulties. A positive association was also found between communication and behavioral difficulties (OR = 3.64; 95% CI: 2.13–6.21; $\chi^2(1) = 24.02$; $\phi = 0.244$; $p < 0.001$). In this pair, teachers who reported communication difficulties had approximately 3.6 times the odds of also reporting behavioral difficulties compared with teachers who did not report communication difficulties.

All three analyzed associations remained statistically significant even after adjusting the p-values using the Holm procedure (adjusted $p < 0.001$ in all cases). The ϕ coefficient values ranged from 0.244 to 0.336, with the highest value found between school-related and communication difficulties and the lowest between communication and behavioral difficulties. The results thus indicate statistically significant positive associations among all three categories of difficulties

reported by teachers.

4. DISCUSSION

The aim of this secondary analysis was to assess the mutual associations between school-related, communication, and behavioral difficulties reported by teachers in connection with the education of students with chronic illnesses. The main finding is the presence of statistically significant positive associations among all three categories of difficulties examined. The highest odds ratio was observed between school-related and communication difficulties (OR = 5.21), followed by the association between school-related and behavioral difficulties (OR = 4.99) and between communication and behavioral difficulties (OR = 3.64). All three associations remained statistically significant even after Holm's correction for multiple testing. The results suggest that educators who report difficulties in one area are more likely to also report difficulties in the other areas examined. This finding supports the need for a comprehensive approach to assessing the educational needs of students with chronic illnesses, without necessarily indicating the co-occurrence of difficulties in individual students.

The most striking association between school-related and communication difficulties highlights the importance of communication in the broader context of school functioning. Communication difficulties can pose a barrier to a student's participation in class, to expressing their educational and health needs, or to interacting with teachers and classmates. In the original dissertation research [15], specific manifestations of communication difficulties included, for example, avoiding communication, limited verbal activity, difficulties with oral expression, and problems related to social interaction. The importance of the broader context of school functioning is demonstrated by a qualitative synthesis that identified links between educational demands, peer relationships, and relationships with school staff in the lives of adolescents with chronic somatic illnesses [6]. James et al. [7] also highlighted the connection between chronic health conditions and school alienation. These findings provide a broader context for interpreting our association but do not constitute direct confirmation of it. Based on the available data, it is not possible to determine whether communication difficulties precede school problems, arise as a result of them, or whether both categories are related to other circumstances not captured by the current analysis.

The importance of communication and social relationships is further supported by the findings of a systematic review focusing on the social functioning and peer relationships of adolescents with chronic pain [9]. Tomberli et al. [8] examined school belonging and return to education among students with chronic or complex health conditions. Although these studies focus on different populations and research questions, they highlight the importance of the social and relational aspects of the school experience. The present analysis complements this broader perspective with the statistical finding that school and communication difficulties are mutually associated in teachers' responses.

The significant association between school-related and behavioral difficulties further suggests that teachers may perceive certain educational challenges in connection with students' behavioral manifestations. From a pedagogical perspective, it is important that such manifestations not be automatically interpreted as a lack of motivation, indiscipline, or a failure to respect school rules. When assessing the behavior of students with chronic illnesses, it is also appropriate to take into account their individual health needs, any limitations on school attendance, and the demands associated with treatment. Efthymiou et al. [11] focused on school-based behavioral interventions and the conditions for the inclusion of children with chronic illnesses in their systematic review. Their work provides a context for considering the interconnection of educational, psychosocial, and organizational measures. However, the circumstances mentioned represent possible contextual influences, not mechanisms proven by our data. The observed association alone does not allow us to determine the causes of specific behavioral manifestations.

The association between communication and behavioral difficulties also deserves attention. Although its magnitude was lower compared to other pairs, it remained statistically significant even after correction for multiple testing. This result is particularly important in relation to the original dissertation research [15], in which the McNemar test did not demonstrate a statistically significant difference between the marginal proportions of communication and behavioral difficulties. The difference between these findings is not a contradiction, as the statistical methods used address different research questions. McNemar's test assesses the equality of marginal proportions in paired dichotomous data [17], whereas Pearson's chi-square test of independence evaluates the association between two categorical variables. The current analysis thus supplements the original results with the finding that communication and behavioral difficulties are statistically associated in teachers' responses, even though their overall frequencies do not differ statistically significantly.

It is also appropriate to place the identified associations within the broader context of research on the educational impacts of chronic illnesses. A systematic review noted that the link between chronic health conditions and lower educational outcomes cannot be sufficiently explained by school absenteeism alone [5]. Another systematic review highlighted the limited certainty of the available evidence regarding the effectiveness of educational support services for children and adolescents with chronic health conditions [12]. Our results therefore cannot be interpreted as evidence of the effectiveness of specific interventions. However, they provide a complementary analytical perspective on the interrelationships among the categories of difficulties identified by educators and support the need for a comprehensive assessment of these difficulties.

4.1. IMPLICATIONS FOR SCHOOL HEALTH POLICY, PRACTICE, AND EQUITY

The identified associations have potential significance for identifying educational needs and planning school-based support. If a teacher observes difficulties in one area in a student with a chronic illness, it may be appropriate to also pay attention to the student's communication, engagement in class, and social functioning. Such an approach should not be based on the assumption that the presence of one difficulty automatically implies the presence of others. The aim is to prevent a one-sided assessment of a student's needs and to promote collaboration among teachers, school support staff, families, and—depending on the individual situation—healthcare professionals. For school practice, it is essential to create conditions in which a student's educational and health needs can be assessed in relation to one another.

From the perspective of school practice, it may be beneficial for teachers, when faced with recurring difficulties in meeting educational requirements, to also consider possible barriers in communication with teachers and peers or limitations related to the student's health condition. Similarly, behavioral manifestations requiring educational intervention should be assessed with regard to individual circumstances, not merely as isolated disciplinary issues. The sharing of relevant information among the school, the family, and, as needed, healthcare professionals must respect the student's privacy and applicable data protection regulations.

From a school policy perspective, the availability of support services, professional development for teachers, and organizational conditions that enable individualized support are crucial. Research among bachelor's-level teacher education students has identified time constraints and inadequate employer support as barriers to participation in professional preparation [13]. Although this research did not focus directly on students with chronic illnesses, it provides a broader context for considering the systemic prerequisites for school-based support. Research on the implementation of the RRRR methodology provides further context for fostering relationships and communication in the school environment through social-emotional learning [10]. However, none of these studies provides direct evidence of the effectiveness of these measures for the population examined in our analysis.

From the perspective of equal educational opportunities, it is essential to prevent situations in which a student's health condition leads to an unreasonable restriction of their participation in instruction or school activities. Individually tailored support may include flexible organization of education, appropriate adjustments to assessment methods, and support for communication between the student, teachers, and the family. The goal of these measures is to enable students with chronic illnesses to participate in education under conditions that respect their health needs while also promoting their independence and social inclusion. However, specific measures must be based on the student's individual situation and relevant professional recommendations.

5. LIMITATIONS

When interpreting the results, it is essential to take into account several methodological limitations. The analysis is based on a cross-sectional questionnaire survey using a non-standardized, self-designed instrument. The variables examined therefore represent difficulties reported by teachers, not independently verified characteristics of individual students. Furthermore, respondents were not required to base their answers to various questions on their experience with the same student. The associations identified therefore cannot be interpreted as confirmation of the co-occurrence of difficulties among specific students with chronic illnesses, nor as evidence of causal relationships.

Another limitation is the use of aggregated contingency tables, which do not allow for the potential influence of other variables, such as school type, length of teaching experience, or characteristics of the chronic illness. Without individual respondent records, it was not possible to conduct a multivariate analysis or to assess any clustering of teachers in individual schools. The estimated odds ratios therefore represent unadjusted pairwise associations.

All 403 respondents from the original questionnaire survey were included in the analytical dataset, including 39 teachers who did not report any previous experience with educating a student with a chronic illness. This fact may influence the interpretation of the responses and the estimated associations. Given that only summary data were available, it was not possible to assess this influence independently. The results must therefore be understood as associations identified in a specific research sample, not as representative estimates for all teachers or students with chronic illnesses in Slovakia.

Despite these limitations, the study provides a complementary analytical perspective on the data from the original dissertation research. While the original comparison primarily examined differences in the frequencies of individual categories of difficulties, the current analysis reveals statistically significant positive associations between these categories at the level of teachers' responses. Future research should use individual student data, validated research instruments, and, where possible, a longitudinal design that would allow for a more precise assessment of the temporal relationships between the areas under study and the factors influencing the educational experiences of students with chronic illnesses.

6. CONCLUSIONS

This secondary analysis of questionnaire data from 403 teachers working at the lower-secondary level (upper grades of elementary school) in Slovakia demonstrated statistically significant positive associations between school-related, communication, and behavioral difficulties reported by respondents in connection with the education of students with chronic illnesses. The strongest association was found between school-related and communication difficulties, followed by associations between school-related and behavioral difficulties and between communication and behavioral difficulties. All three associations remained statistically significant after Holm's correction for multiple testing.

The results suggest that the individual categories of difficulties are not mutually independent in teachers' responses. From the perspective of school practice, they support the need for a comprehensive assessment of the educational needs of students with chronic illnesses, one that, in addition to school-related difficulties, also pays attention to communication, behavioral manifestations, and the conditions of school functioning. Such an approach can serve as a basis for coordinated collaboration among teachers, school support staff, families, and—depending on individual needs—healthcare professionals.

Given the cross-sectional nature of the original study, the use of a non-standardized questionnaire, and the analysis of aggregated teacher responses, the identified associations cannot be interpreted as causal relationships or as confirmation of the co-occurrence of difficulties among specific students. Future research should use individual student data, validated research instruments, and a longitudinal design to more accurately clarify the relationships between the areas under study and their significance for planning school-based support.

Human Subjects Approval Statement

The original questionnaire survey conducted as part of the doctoral research [15] was approved by the relevant ethics committee, according to confirmation provided by the author team. The research was conducted at the Department of Special Education, Faculty of Education, Comenius University Bratislava, Slovakia. The present study constitutes a secondary analysis of aggregated data from the original questionnaire survey. No new data were collected, and no further contact with respondents occurred as part of this analysis.

Author Contributions

All authors contributed equally to this study and to the preparation of the manuscript. All authors read and approved the final version for publication.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

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

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