

Intersectoral Costs and Benefits of Mental and Behavioural Disorders in the Education Sector

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Intersectoral Costs and Benefits of Mental and Behavioural Disorders in the Education Sector: an Exploration of Costing Methods

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Abstract

Background: The inclusion of indirect spillover costs and benefits that occur in non-healthcare sectors of society is necessary to make optimal societal decisions when assessing the cost effectiveness of healthcare interventions. Education costs and benefits are relevant in the disease area of mental and behavioral disorders, but their inclusion in economic evaluations is largely neglected due to lack of methodological knowledge.

Aim of the Study: This study aims to explore, using a scoping review, the identification, measurement, and valuation methods used to assess the impact of mental and behavioural disorders on education costs and benefits.

Methods: A scoping review was conducted to identify articles that were set in the education sector and assessed education costs and benefits. An adapted 5-step approach was used: (i) initiating a scoping review; (ii) identifying component studies; (iii) data extraction; (iv) reporting results; (v) discussion and interpretation of findings. Results were summarized in a narrative synthesis per identification, measurement, and valuation method.

Results: 177 component articles were identified in the scoping review that reported 61 mutually exclusive education costs and benefits. The nomenclature used to describe the costs and benefits was poorly defined, heterogeneous in nature and largely context dependent. This was also reflected in the diverse number of measurement and valuation methods found in the component articles.

Discussion: This is the first study, which offers a classification of education costs and benefits and costing methods reported by studies set in the education sector. In conclusion, mental and behavioral disorders have a notable impact on a variety of different education costs and benefits.

Implications for Health Policies: The classification provided in the current study gives an indication of the wide-spread impact of mental and behavioral disorders on the education sector. Hence, the inclusion of relevant education costs and benefits in economic evaluations for mental and behavioral disorders is necessary to make optimal societal decisions.

Implications for Further Research: By exploring a new area of research from a sector-specific perspective, the current study adds to the existing intersectoral cost and benefit literature base. Future research should focus on standardizing costing methods in pharmacoeconomic guidelines and assessing the relative importance of individual education costs and benefits in economic evaluations for specific interventions and diseases.

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Background

Mental and behavioral disorders (MBDs) affect approximately one in four European citizens every year, making it one of the top public health challenges of Europe. Treatment options are available; however, almost two-thirds of individuals with a known MBD will not seek treatment due to neglect and fear of stigma and discrimination.¹ These disorders impair patients' functional capabilities, cause distress and have been associated with developmental concerns, which adversely affect their ability to actively participate in society.² This is reflected in the tremendous economic costs of MBDs, "directly via relatively low costs in the healthcare system and indirectly via proportionally high productivity losses and [its] impact on economic growth".³ Additionally, indirect costs are incurred through public income support payments, reduced educational attainment, costs associated with other consequences such as incarceration or homelessness, early mortality and reduced labor supply.⁴ Indirect costs are costs for which no payment is made, but for which there is a foregone benefit, i.e. opportunity cost.⁵

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Intersectoral costs and benefits (ICBs) are an example of indirect costs and cost savings that occur in non-healthcare related sectors and are attributable to the implementation of healthcare interventions.⁶ Drost *et al.*⁶ identified five sectors wherein ICBs of mental health interventions can occur; these include the “education,” “labor and social security,” “household and leisure,” “the criminal justice system” and “individual and family” sectors. Costs and benefits in the education sector are of particular relevance for MBDs.^{4,9,10} The cost in the education sector associated with supporting individuals with MBDs can be far higher than the costs of supporting their peers, due to additional support provision and poor education outcomes.¹¹ Previously identified costs and benefits in the education sector for MBDs include “change in school readiness,” “low school adaptation/competence,” “teacher-student conflicts,” “disrupted school experience” and “special education services”.⁶ Given that interventions targeting MBDs are expected to generate ICBs,^{6,7} it is necessary to account for them when conducting economic evaluations from a societal perspective to make optimal societal decisions.⁸

Economic evaluations are a tool used by policy makers to support the allocation of scarce healthcare resources. For economic evaluations to accurately support decision-making, the measurement and valuation of relevant costs and benefits related to an intervention and disease are essential.¹² This is particularly relevant for MBDs, where global government spending is lower than required, based on the proportionate burden of these disorders and the availability of interventions.¹³ The measurement of ICBs in economic evaluations conducted in the disease area of MBDs is complex due to the nature of the patient population, incomplete cost categories, lack of cost definitions and data, deficiencies in the definition of disorders, sources of service utilization and costs¹⁴ and lack of methodological knowledge to value ICBs.^{15,16} Previous research in the field has focused costing methods set in the healthcare sector.^{6,17-20} However, to date, no research has been conducted to assess which education costs and benefits are identified, measured, and valued in empirical research set in the education sector. Identifying education costs and benefits from a specific sector can aid in assessing the wide-spread impact of mental and behavioral disorders.

Aim of the Study

The objective of this study is to explore and provide an overview of the identification, measurement and valuation methods used to assess the impact of MBDs on education costs and benefits occurring in the education sector, by means of a scoping review.

Methods

A scoping review was conducted from October 2018 to January 2019 to identify articles that were set in the

education sector and reported education costs and benefits related to MBDs or interventions targeting MBDs. An adapted review method for systematic literature review of economic evaluations was used and reporting was based on the PRISMA extension for scoping reviews (PRISMA-ScR) statement.^{21,22} The review protocol is registered (CRD42019111746) in PROSPERO.

Data Collection

The search strategy used the following electronic bibliographic indexes of published literature: MEDLINE (PubMed), PsycINFO (EBSCO), Education Resources Information Centre (ERIC; EBSCO), Social Science Citation Index (SSCI; Web of Science) and Science Citation Index (SCI) Expanded (Web of Science). A search string was formed using a population, exposure and outcome-based scheme: “education,” “costs,” “mental disorder” and “behavioural disorder.” The search string was constructed using previously identified education costs and benefits,⁶ MBD identified by the 11th version of International Classification of Diseases (ICD)²³ and the Boolean operator terms AND and OR. Refer to **Appendix, Table A1** for the complete search string. Additionally, reference list scans were employed to increase the specificity of the search.

Article Inclusion and Exclusion

Using a priori selection criteria, an independent reviewer reviewed the titles and abstracts and if necessary, the complete publication of all identified component articles. Component articles were considered relevant, if they fulfilled the inclusion criteria that were defined according to the patient population, reported outcomes, data type and setting of interest.

The patient population had to be diagnosed with or at risk of a MBD. The ICD 11th Revision was used to identify MBDs (code: 06). For this study, neurodevelopmental disorders (codes: 6A00-6A06) were not included. Hence, relevant conditions and disorders include: schizophrenia or other primary psychotic disorders, mood disorders, anxiety or fear-related disorders, obsessive-compulsive or related disorders, disorders specifically associated with stress, feeding or eating disorders, elimination disorders, disorders of bodily distress or bodily experience, disorders due to substance abuse or addictive behaviours and disruptive behaviour or dissocial disorders.²³ At least one education cost and benefit had to be reported as an outcome. The data had to be reported on a primary-level. Research had to be conducted in the education setting. The International Standard Classification of Education 2011 was used to define activities that fell within the education sector. Relevant education levels include early childhood, primary, lower secondary, upper secondary, post/secondary non-tertiary, short-cycle tertiary, bachelor or equivalent, master or equivalent, doctoral or equivalent, and not elsewhere classified.²⁴ Component articles were excluded if they were not published in English, Dutch or German and published outside the 20-year window (i.e. 1998-2018). These

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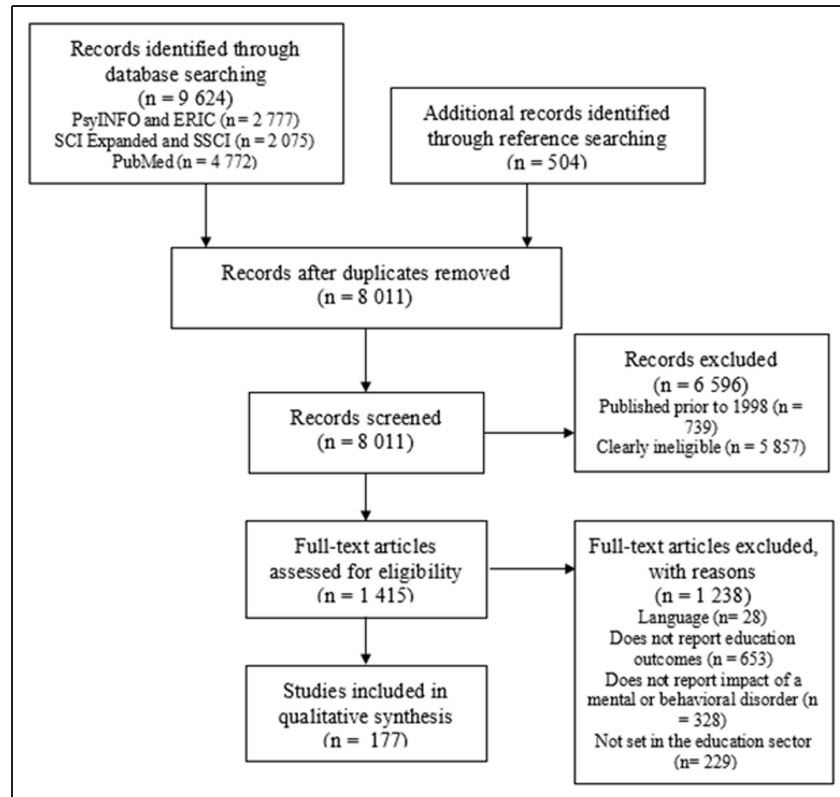


Figure 1. Adapted PRISMA 2009 Flow Diagram of Component Studies from Tricco *et al.*²¹

additional restrictions were set to accommodate to resource and time constraints.

Data Extraction

Upon inclusion, an independent reviewer extracted relevant information from each article manuscript. A data extraction sheet, which was developed to extract data from economic evaluations,²⁵ was adapted in collaboration with one of the co-authors. Variables were distinguished as either general study characteristics or identification, measurement, and valuation variables. This included: (i) general study characteristics: first author; publication year; document type; perspective; country; setting; education level; mean age; study population size; sex; MBD investigated; (ii) identification variables: cost category name; (iii) measurement variables: data source of resource use (clinical trials/administrative data/clinical databases/medical records/published literature/other); method for identifying resource use (questionnaire/survey/cost diaries/expert consultation/formal consensus method/other); resource use measurement (RUM) name; administration; and (iv) valuation variables: unit costs method (guidelines/own price calculations/hourly labour costs/opportunity costs/literature/other); cost per unit; standard deviation; measurement unit, costing currency; year of costing; discount rate.

Data Analytic Procedure

Findings were summarized in a narrative (descriptive)

synthesis under the following headings:

- (i) Identification of education costs and benefits
- (ii) Measurement of education costs and benefits
- (iii) Valuation of education costs and benefits

Reported costs and benefits were categorized based on the taxonomy developed by Drost *et al.*⁶ to create a mutually exclusive list of education costs and benefits using deductive reasoning. Newly identified costs and benefits were added to the taxonomy. Identified education costs and benefits were then grouped together and classified into categories based on basic and shared characteristics using inductive reasoning. The currencies and measurement methods stated in component articles were retained and extracted as reported.

Results

Search Results

A total of 9 624 records were generated in the database search. To ensure completeness, the reference lists were scanned, identifying an additional 504 records. 177 records were ultimately included in the narrative synthesis (refer to **Figure 1**). The most investigated MBDs in the component articles were disorders due to substance use or addictive behaviours, mood disorders, anxiety or fear-related disorders and disruptive behaviour or dissociative disorders. Other disorders that were assessed included schizophrenia or other primary psychotic disorders, obsessive-compulsive or related

Table 1. Most frequently Reported Education Costs and Benefits.

Ranking	Education cost and benefit	Category of education cost and benefit	Times reported (#)	Sources
1	Overall academic performance	Academic performance	66	[26-74]
2	Subject-specific academic performance		54	[28, 30-32, 34, 47, 48, 71, 75-86]
3	Undefined absence from school	School attendance	51	28, 29, 34, 37, 39, 42, 44, 50, 56, 57, 64, 77-79, 86-96]
4	Upper secondary school attainment	Educational attainment	41	[44, 58, 76, 96-116]
5	Aggression at school	Social competence at school	36	[34, 56, 66, 81, 84, 117-129]
6	General disciplinary incidents at school	Disciplinary incidents at school	34	[28, 34, 37, 44, 46, 77, 78, 95, 119, 130, 131]
7	Social adjustment at school	Social competence at school	33	[51, 53, 60-62, 84, 89, 98, 119, 121, 123, 124, 132-138]
8	Higher education attainment	Educational attainment	26	[30, 76, 97, 98, 100, 108, 109, 112, 116, 139-145]
9	General school wellbeing measures	General school wellbeing measures	24	[30, 38, 78, 88, 98, 138, 145-155]
10	Mental health services provided at school	Additional school services	17	[58, 64, 81, 85, 89, 156-162]

Note: Ranking was generated based on the number of times the item was reported in the component articles (n = 177).

disorders, disorders specifically associated with stress, feeding or eating disorders and elimination disorders.

Identification of Education Costs and Benefits

A total of 681 education outcomes were identified in the component articles (n = 177). The reported items were condensed into 61 mutually exclusive education costs and benefits. These cost items were categorized into 18 categories that ranged from “academic aspirations” to “teacher attendance.” The most frequently reported education costs and benefits were “overall academic performance,” “subject-specific academic performance,” “undefined absence from school,” “upper secondary school attainment,” “aggression at school,” “general disciplinary incidents at school,” “social adjustment at school,” “higher education attainment,” “general school wellbeing measures” and “mental health services provided at school” and are reported in **Table 1**. The most frequently reported education costs and benefits reported fell under the cost categories: academic performance (n = 2), educational attainment (n = 2), social competence at school (n = 2), additional school services (n = 1), disciplinary incidents at school (n = 1), general school wellbeing measures (n = 1) and school attendance (n = 1). Some costs and benefits were only reported once in the component articles. These items

included: “adult education services,” “alternative school attendance,” “lower secondary school attainment,” “school participation,” “intrusion resistance,” “parent involvement in school,” “school mobility,” “general school readiness,” “school readiness: behaviour issues,” “school readiness: cognitive ability,” “school readiness: inattention,” “school readiness: reading ability” and “teacher absenteeism.” For a complete overview of all identified cost items and measurement methods, refer to **Appendix, Table A2**.

Measurement of Education Costs and Benefits

Measurement methods were reported for 59 of the 61 identified education costs and benefits. Relevant measurement methods that were extracted from component articles were the data source, method of measurement, and administration. The two most reported data sources were “trial” (n = 450) and “school records.” (n = 150). Trial were measurement methods that were conducted specifically for research purposes, e.g. by use of questionnaires or interviews. School records were measurement methods that used existing school data that were extracted for research purposes. Component studies report using multiple data sources to measure the same education cost and benefit, e.g. “overall academic performance.” A variety of cost measurement methods were used including interviews,

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questionnaires, surveys and observation and administration ranged from self-reported to proxies, e.g. teachers, parents, caregivers, observers. For a complete list of measurement data sources, measurement methods, RUM names and administration for all education costs and benefits, refer to **Appendix, Table A2**.

Table 2 presents the measurement methods used for the most frequently reported education costs and benefits. The measurement methods used for these measures were heterogeneous in nature. Education costs and benefits, such as overall academic and subject-specific performance, undefined absence from school, higher and upper secondary school attainment, general disciplinary incidents at school and mental health services provided at school, were largely reliant on school records; however, trials and administrative records, i.e. school district databases, were also used. Other education costs and benefits, e.g. aggression at school and social adjustment at school, were reliant on trials. Administration was heterogeneous in nature and ranged from self-report to proxies. Reported proxies included classroom peer, observer, peers, staff members, and teacher.

Valuation of Education Costs and Benefits

Six component studies reported valuation methods. The education costs and benefits valued include “additional services provided at school,” “special education services provided at school,” “mental health services provided at school,” “adult education services,” “expulsion from school,” “general school wellbeing measures,” “grade retention,” “undefined absence from school,” “expulsion at school,” and “disruptive behaviour at school.” Three of the most frequently reported education outcomes were valued. Costs per unit prices were not reported for most of the valued cost items. Tangible costs, e.g. “mental health services provided at school,” and intangible costs, e.g. “exclusion at school,” were valued. Guidelines, own price calculations, literature and opportunity costs were used to assign a unit price to education costs and benefits. Different unit costs methods were used per cost and benefit. Refer to **Table 3** for an overview of the valuation methods and costs per cost item reported in component articles.

Discussion

As stated in the introduction, little is known about education costs and benefits in relation to MBDs, particularly concerning their inclusion, measurement and valuation in costing studies. This is the first study that has provided an overview of the identification, measurement and valuation methods used to assess education costs and benefits reported by empirical studies set in the education sector. The literature search generated 177 component articles, which assessed the impact of MBD on education costs and benefits. The reported education costs and benefits outcomes (n = 681) were condensed into 61 mutually exclusive items that were tangible and intangible. The most frequently reported

education costs and benefits were overall and subject-specific academic performance.

One manner to classify costs is according to whether they can be measured in monetary terms. The valuation of intangible costs is commonly recognized as problematic in economic evaluations, because they do not have a market price.^{166,167} Hence, limited economic evaluations include these types of costs in their respective costing analysis.¹⁶⁷ Approaches that can be used to assess intangible costs include change in quality-adjusted life years¹⁶⁸ and disability-adjusted life years¹⁶⁹ measures, the human capital method¹⁶⁹ and contingent valuation methods.^{167,170-176} The intangible cost items identified in the literature review range from outcomes related to academic performance to social adjustment at school. Healey and Chisholm¹⁷³ state that when conducted in a meaningful and valid manner, the monetization of intangible costs could provide decision makers with an improved evidence-based framework for resource allocation. This is confirmed by the intangible education costs and benefits that were identified in this literature review for MBDs.

The reported education costs and benefits showed a high degree of inter- and intra-item heterogeneity. To a certain degree, the heterogeneity of cost items reflects contextual factors of the education sector. These contextual factors include education- and country-level specific differences. Education systems are usually mandated and administered on different levels per country. Hence, the education system in one country or province can vary greatly from another in terms of its organization and governance, the quality of education, the funding of educational activities, and the freedom of education in the public and private sector.¹⁷⁷ Costs and benefits that were mainly impacted by contextual-factors were subject-specific academic performance and general academic performance. For example, subject-specific academic performance included grades in the native language class and general academic performance included national standardized test scores that assessed performance on a range of subjects, e.g. the SAT in the United States of America. The contextual factors of some measures affect the transferability and comparability of results across studies. Moreover, it should be made clear what is being measured and valued to avoid misunderstandings and double counting. Using a relevant reporting checklist, such as the Consolidated Health Economic Evaluations Standards (CHEERS) statement,¹⁷⁸ and including definitions of cost items in the methodology section of the article could be possible solutions.

The accuracy of captured data is dependent on the resource use method used. The two most reported methods of data collection in the component studies were trial, i.e. RUM methods, and school records. School records are routinely collected to meet the administrative needs of the school. This data is reliable; however, it is often limited to outcomes, such as attendance, academic performance and reported disciplinary incidents, and is not designed for research purposes. Moreover, informed patient consent needs to be obtained prior to data extraction and researchers are dependent on the data collection methods used by the school.

Table 2. Measurement Methods Reported in Component Articles.

Ranking	Education cost and benefit	Measurement method				Sources
		Data source	Method	Administration		
1	Overall academic performance	Administrative records; School records; Trial	Interview; Questionnaire; Survey	Proxy: father, mother, parent, school nurse, teacher; Self-report	[26-74]	
2	Subject-specific academic performance	Administrative records; School records; Trial	Interview; Observation; Questionnaire	Proxy: caregiver, examiner, teacher or teaching assistant; Self-report	[28, 30-32, 34, 47, 48, 71, 75-86]	
3	Undefined absence from school	Administrative records; School records; Trial;	Cost diaries; Interview; Questionnaire	Proxy: caregiver, parent, researcher, school nurse; Self-report	[28, 29, 34, 37, 39, 42, 44, 50, 56, 57, 64, 77-79, 86-96]	
4	Upper secondary school attainment	Administrative records; Clinical database; School records; Trial	Interview; Questionnaire; Survey	Proxy: family members, researcher; Self-report	[44, 58, 76, 96-116]	
5	Aggression at school	Clinical database; School records; Trial	Interview; Observation; Questionnaire; Survey	Proxy: classroom peer, observer, peers, staff members, teacher; Self-report	[34, 56, 66, 81, 84, 117-129]	
6	General disciplinary incidents at school	School records; Trial	Interview; Questionnaire; Survey	Proxy: caregiver, parent, school district's Safe and Drug-Free School Coordinator/Drug Prevention Coordinator, teacher; Self-report	[28, 34, 37, 44, 46, 77, 78, 95, 119, 130, 131]	
7	Social adjustment at school	Trial	Interview; Questionnaire; Survey	Proxy: classroom peer, peers, teacher; Self-report	[51, 53, 60, 62, 66, 84, 89, 118, 119, 121, 123, 124, 132-138]	
8	Higher education attainment	Administrative records; School records; Trial	Interview; Questionnaire	Proxy: family members; Self-report	[30, 76, 97, 98, 100, 108, 109, 112, 116, 139-145]	
9	General school wellbeing measures	School records; Trial	Interview; Observation; Questionnaire; Survey	Proxy: caregiver, father, mother, parent, rater, teacher; Self-report	[30, 38, 78, 88, 98, 138, 146-155]	
10	Mental health services provided at school	School records; Trial	Interview; Questionnaire	Proxy: English/language arts, reading and math teacher, mother, parent, school mental health professional, student nurse, teacher; Self-report	[58, 64, 81, 85, 139, 156-162]	

Note: Ranking was generated based on the number of times the item was reported in component articles (n = 177).

Table 3. Valuation Methods and Costs Reported in Component Articles (n = 6).

Ranking	Education cost and benefit	Unit costs method	Cost per cost and benefit					Source
			Cost per unit (SD)	Unit	Costing currency (year of costing)	Discount rate (%)		
1	Overall academic performance	NA	NA	NA	NA	NA	NA	
2	Subject-specific academic performance	NA	NA	NA	NA	NA	NA	
3	Undefined absence from school	OPC	4.80	Hour	Euros (2012)	4	[90]	
4	Upper secondary school attainment	NA	NA	NA	NA	NA	NA	
5	Aggression at school	NA	NA	NA	NA	NA	NA	
6	General disciplinary incidents at school	NA	NA	NA	NA	NA	NA	
7	Social adjustment at school	NA	NA	NA	NA	NA	NA	
8	Higher education attainment	NA	NA	NA	NA	NA	NA	
9	General school wellbeing measures	NR	NR	NR	Pound sterling (2009)	NR	[163]	
10	Mental health services provided at school	Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
		Literature; OPC	NR	NR	USD (2000)	NA	[156]	
		Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
12	Grade retention	Literature; OPC	NR	NR	USD (2000)	NA	[156]	
22	Special education services provided at school	Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
		OC	9 936.00	NR	Pound sterling (1998)	NA	[164]	
		OC	10 936.00	NR	Pound sterling (1998)	NA	[164]	
		Literature; OPC	NR	NR	USD (2000)	NA	[156]	
		Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
		Guidelines	39.12 (156.00)	NR	Pound sterling (2000/1)	NA	[165]	
		Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
24	Disruptive behaviour at school	Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
29	Exclusion at school	OC	7 232.00	NR	Pound sterling (1998)	NA	[164]	
		Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
37	Additional services provided at school	Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
44	Expulsion from school	Guidelines; OPC	NR	NR	Pound sterling (1996/7)	NA	[161]	
49	Adult education services	OC	91.00	NR	Pound sterling (1998)	NA	[164]	

Note: Ranking was generated based on the number of times the item was reported in the component articles (n = 177). NA = not application; NR = not reported; OC = opportunity costs; OPC = own price calculation; SD = standard deviation.

The component students that reported measurement methods generated from trials was prospectively and retrospectively collected using questionnaires, surveys, interviews, cost diaries and observation. This method of resource use measurement is often subject to external and internal scoping, memory decay and recency bias.¹⁷⁹ Moreover, it introduces an additional burden to respondents, i.e. students, parents of students, teachers, classroom peers.¹⁸⁰ However, this method allows for outcomes to be measured that are not routinely collected for administrative purposes, e.g. 'social adjustment at school.' Generally, methods of RUM employed in trial-based economic evaluations are used in combination with school and other administrative records.¹⁸¹ This is reflected in the overview of measurement methods in this review. When selecting a measurement method, the various advantages and disadvantages should be considered to make an evidence-based decision. Given the significance of education costs and benefits and methodological difficulties, a greater degree of standardization needs to be achieved.

Valuation was largely neglected in the component studies. The literature review identified the valuation of tangible, e.g. mental health services provided at school, and intangible cost items, e.g. exclusion at school and disruptive behaviour at school. Drost *et al.*⁶ identified four methods that could be applied to value the education costs and benefits identified in this review: opportunity costs, an acknowledged source, self-construction and hourly labour costs. Opportunity costs are defined as "the benefits omitted as a result of the time spent providing alternative services." This method generates the most precise estimates of unit prices but is time consuming to calculate. Acknowledged sources that are transparent and reliable include governmental reports and annual reports of related institutions. Valuation can also be based on self-constructed unit prices and hourly labour costs. The usability and feasibility of these methods has been assessed for education cost items,¹⁸² but inclusion of ICBS is still neglected in economic evaluations.¹⁸³ Six unit prices were identified in this scoping review. "Undefined absence from school" was the only item whose resource use had been identified and measured in its natural unit and values (i.e. hours absent). The remaining valued cost items had absolute price levels. It should be ensured that estimated consumption of resources and their unit prices reflect the real-world settings that the studies are being conducted in.²²³

Despite the focus of this study being education costs and benefits being identified within the scope of MBDs, the framework presented in **Appendix, Table A2** could also be used for other disease areas that may have spill over effects in the education sector. For example, costs related to the development and implementation of school reintegration programs for children with cancer.²²² However, it should be noted that ICBS are disease and condition-specific, even within MBDs.⁶ For example, individuals with a known externalizing disorder have a higher school drop-out rate than those with an internalizing disorder.¹⁰ Moreover, some MBDs have a larger impact on the education sector compared to others. A review of economic studies across child and adolescent mental health interventions found that

the 2012 US costs in the education sector for supporting children and adolescents with depression was less costly compared to conduct disorders, despite both disorders being associated with poor health and quality of life outcomes in adult life.¹¹

This study has attempted to do something rather different compared to earlier research concerning ICBS, because this review limited the setting wherein the research had to be conducted and provides a comprehensive overview of education costs and benefits and their costing methods in one article. A robust and transparent methodology was used to identify component articles with reference searching to increase the specificity of the search. However, grey literature was not considered, which could have introduced publication bias and decreased the review's comprehensiveness. Methodological grading was not completed for the component articles; hence, it is unknown whether the quality of the component article has an influence on the choice and reporting of the employed costing methods. Future researchers could employ a more systematic methodology and investigate whether methodological grading plays a role in this regard. Moreover, the selection process was conducted by one independent reviewer. To avoid human error and bias in all phases of the review at least two independent reviewers should be involved.²¹

The broad definition of exclusion and inclusion criteria could have implications for the applicability of the overview. The overview provided in this review was generated based on a broadly defined disease area, which could have implications when applied to a specific MBD, e.g. anorexia nervosa. Hence, it is not clear for which disorders the identified ICBS and costing methods are relevant. Moreover, factors, such as age, that could influence the costs incurred by the education sector and could influence which ICBS are measured in economic evaluations were not considered in the review. For example, economic evaluations conducted in the disease area of MBDs have found that the largest proportion of measured costs and benefits fall within the education sector for younger children and within the criminal justice sector for adolescents.¹¹ Other factors that could influence the inclusion of ICBS are administrative tradition, culture, values, institutional context,¹⁸⁴ perspective,¹⁸⁵ pharmacoeconomic guidelines, the nature of the disease and other study population characteristics.

Furthermore, all component studies were set in the education sector. Studies evaluating the cost-effectiveness of MBDs in the healthcare sector commonly neglect the inclusion of education costs and benefits.¹⁸³ This has been accredited to varying conceptualizations of the societal perspective¹⁸³ and measurement challenges.¹⁵ Hence, education costs and benefits may be identified, measured and valued in studies conducted in the education sector, but this is not reflected in the healthcare sector. Moreover, a comparable ICBS classification scheme generated by Drost *et al.*⁶ exhibited significant differences when compared to the scheme generated in this review. The scheme of Drost *et al.*⁶ had fewer items in the education sector, was less specific and did not accommodate context-specific differences. Research will have to be conducted to investigate whether the

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specificity of cost items in economic evaluations and burden of illness studies is necessary to measure a notable difference in costs.

Implications for Health Policies

Including ICBs in economic evaluations contributes to optimal societal decision-making and is aligned with the Health in All Policies (HiAP) approach. HiAP is a framework developed by the World Health Organization, which emphasizes the widespread consequences of public policies on health systems, societal wellbeing and contributes to sustainable development.¹⁸⁶ This study confirms that MBDs demonstrate a widespread societal impact with a variety of costs and benefits identified in the education sector. The identification, measurement and valuation methods identified in this scoping review were heterogeneous and could partly be explained by contextual factors related to local education systems. Future research should focus on further investigating contextual factors that could impact costs and benefits in the education sector and how this could affect economic evaluations and validating and prioritizing the costing methods identified in this literature review. More research could aid in standardizing the costing methods for education costs and benefits; however, context-dependent factors cannot be disregarded.

Implications for Further Research

By exploring a new area of research from a sector-specific perspective, the current study adds to the existing intersectoral cost and benefit literature base. Future research should focus on assessing the relative importance of individual education costs and benefits in economic evaluations for specific interventions and diseases. Moreover, future research should be invested into standardizing costing methods to ensure reliable results and cross-study comparisons. Efforts should be made to accommodate regional and national differences in education systems and availability of school data and records.

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Appendix

Table A1. Complete Search String.

The complete search string used in all databases is listed below.
("pre-school" OR "change in school readiness" OR "problems with school entry" OR school OR "low school adaptation" OR "low school competence" OR "low school participation" OR "low school engagement" OR "low school attainment" OR "low school productivity" OR "low school performance" OR "cognitive deficits" OR "failing to meet school obligations" OR "low education outcomes" OR "school failure" OR "disrupted school experience" OR "teacher student conflict" OR "school dropout" OR "pre-mature leave" OR "special education services" OR "home education" OR "residential programs" OR education[MeSH]) AND (costs OR benefits OR effects OR consequences OR burden OR impact) AND ("mental disorder" OR ("behavioural disorder" OR "behavioral disorder")) OR schizophrenia OR psychotic OR catatonia OR "mood disorder" OR depressive OR bipolar OR "anxiety disorder" OR "panic disorder" OR phobia OR "obsessive-compulsive disorder" OR "body dysmorphia" OR hypochondriasis OR "olfactory reference disorder" OR ("body-focused repetitive behavior disorder" OR "body-focused repetitive behaviour disorder") OR "hoarding disorder" OR "post traumatic stress disorder" OR "prolonged grief disorder" OR "adjustment disorder" OR "reactive attachment disorder" OR "dissociative disorder" OR "anorexia nervosa" OR "bulimia nervosa" OR "binge eating disorder" OR "avoidant-restrictive food intake disorder" OR pica OR "rumination-regurgitation disorder" OR enuresis OR encopresis OR "bodily distress disorder" OR "body integrity dysphoria" OR "substance use" OR "addictive disorder" OR pyromania OR kleptomania OR ("compulsive sexual behaviour disorder" OR "compulsive sexual behavior disorder" OR "gambling disorder" OR "gaming disorder" OR "oppositional defiant disorder" OR "conduct-dissocial disorder" OR "personality disorder" OR "paraphilic disorder" OR "voyeuristic disorder" OR "pedophilic disorder" OR "coercive sexual sadism disorder" OR "frotteuristic disorder" OR "factitious disorder")

Table A2. Complete Identification and Measurement List of Cost Items, Including Sources.

Measurement method						
Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
Academic aspirations	Academic aspirations	Trial	Survey	Self-developed	Self-report	[53, 128]
Academic performance	Overall academic performance	Administrative records; School records; Trial	Interview; Questionnaire; Survey	Teacher Report of Classroom Behavior; Self-developed; European School Survey Project on Alcohol and Other Drugs; Communities that Care; Self-developed; Child Obsessive Compulsive Impact Scale; Kaufman Text of Educational Achievement; Case Management Outcome Data Form; California Youth Tobacco Survey instrument; Adapted AddHealth Wave I in-home questionnaire	Proxy: teacher; Self-report; Proxy: father; Proxy: mother; Proxy: parent; Proxy: school nurse	[26-74]
	Subject-specific academic performance	Administrative records; School records; Trial	Interview; Observation; Questionnaire	Woodcock-Johnson Psycho-Educational Battery-Revised; Kaufman Text of Educational Achievement; The Comprehensive Test of Basic Skills; Force Concept Inventory; Spache Diagnostic Reading Scale; School Status and Improvement Report; Adapted AddHealth Wave I in-home questionnaire	Self-report; Proxy: caregiver; Proxy: examiner; Proxy: teacher or teaching assistant	[28, 30-32, 34, 47, 48, 71, 75-86]
Additional school services	Additional services provided at school	Trial	Interview	Client Service Receipt Interview for Childhood; World Mental Health version of the Adolescent Composite International Diagnostic Interview	Proxy: mother; Self-report	[161, 187]
	Mental health services provided at school	School records; Trial	Interview; Questionnaire	School Mental Health Professional Report; Teacher Report of Classroom Behavior-Checklist Form; Service Assessment for Children and Adolescents; The Climate Survey; Medication Administration Survey; Client Service Receipt Interview for Childhood; Case Management Outcome Data Form	Proxy: school mental health professional; Proxy: English/language arts, reading and math teacher; Self-report; Proxy: parent; Proxy: student nurse; Proxy: mother; Proxy: school nurse; Proxy: teacher	[58, 64, 81, 85, 89, 156-162]
Adult education services	Special education services provided at school	Administrative records; School records; Trial	Interview; Questionnaire	Individualized Education Program Record Review; The Climate Survey; Client Sociodemographic and Service Receipt Inventory	Proxy: researcher; Self-report; Proxy: teacher	[76, 84, 156, 158, 164, 165]
	Adult education services	Trial	Survey	NR	Self-report	[164]



(continued)

Measurement method						
Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
Alternative school attendance	Alternative school attendance	Trial	Interview; Questionnaire; Survey	NR	Proxy: school district's Safe and Drug-Free School Coordinator/Drug Prevention Coordinator	[131]
Disciplinary incidents at school	Expulsion from school	Trial	Interview; Questionnaire; Survey	Soziale Integration, Klassenklima und Selbstkonzept der Schulfähigkeit (Social integration, classroom Climate and Self-concept of School Readiness); Client Service Receipt interview for Childhood; British Child and Adolescent Mental Health Survey 2004 and 2007; Child Social Preference Scale	Self-report; Proxy: teacher; Proxy: mother; Proxy: parent	[56, 131]
	General disciplinary incidents at school	School records; Trial	Interview; Questionnaire; Survey	Self-developed; Child Behavior Checklist	Proxy: caregiver; Proxy: school district's Safe and Drug-Free School Coordinator/Drug Prevention Coordinator; Self-report; Proxy: parent; Proxy: teacher	[28, 34, 37, 44, 46, 77, 78, 95, 119, 130, 131]
	Suspension from school	Administrative records; School records; Trial	Interview; Questionnaire; Survey	Communities that Care; School Status and Improvement Report; Teacher Report of Classroom Behavior-Checklist Form; Add Health Study; 3-City Study	Self-report; Proxy: English/language arts, reading and math teacher; Proxy: school district's Safe and Drug-Free School Coordinator/Drug Prevention Coordinator	[34, 35, 44, 46, 56, 62, 72, 79, 81, 86, 92, 131]
Educational attainment	Higher education attainment	Administrative records; School records; Trial	Interview; Questionnaire	School Questionnaire; Self-developed; Composite International Diagnostic Interview; Questionnaire developed for the Price Foundation Studies; World Health Organization Composite International Diagnostic Interview; National Population Health Survey; Communities That Care Youth Survey	Self-report; Proxy: family members	[30, 76, 97, 98, 100, 108, 109, 112, 116, 139-145]
	Lower secondary school attainment	Trial	Interview	School Questionnaire	Self-report	[98]
	Primary school attainment	Trial	Interview	Composite International Diagnostic Interview; World Health Organization Composite International Diagnostic Interview	Self-report	[112, 142]



(continued)

Measurement method

Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	Undefined educational attainment	Administrative records; Clinical database; School records; Trial	Interview; Survey	Case file extraction form; World Mental Health version of the Adolescent Composite International Diagnostic Interview	Proxy: caregiver; Self-report; Proxy: family members; Proxy: other	[46, 77, 92, 101, 102, 106, 108, 113, 114, 141, 187-190]
	Upper secondary school attainment	Administrative records; Clinical database; School records; Trial	Interview; Questionnaire; Survey	Check & Connect Monitoring Sheet; School Questionnaire; Mental Health Supplement to the Ontario Health Survey; Collaborative Psychiatric Epidemiological Survey; Self-developed; Price Foundation studies questionnaire; Composite International Diagnostic Interview; World Health Organization Composite International Diagnostic Interview	Proxy: researcher; Self-report; Proxy: family members	[44, 58, 76, 96-116]
General school wellbeing measures	General school wellbeing measures	School records; Trial	Interview; Observation; Questionnaire; Survey	Teacher Perception of Risk Screening Instrument; Self-developed; Secondary School Readiness Inventory; School Questionnaire; Child Behavior Checklist; Teacher's Report Form; Teacher Observation of Classroom Adaptation-Revised; School engagement scale; College Affiliation Questionnaire; Teacher's Report Form; Child and Adolescent Functional Assessment Scale; Teacher Risk Assessment; Strengths and Difficulties Questionnaire; Eating and Body Image Disturbances Academic Interference Scale; Social Adjustment Scale: Self-developed; The Swanson, Kotkin, Agler, M-Flynn and Pelham Rating Scale; Behavior Assessment Scale for Children, Second Edition Teacher Rating Scale-Child; School Inclusion Questionnaire	Proxy: teacher; Self-report; Proxy: parent; Proxy: mother; Proxy: father; Self-report; Proxy: rater; Proxy: caregiver	[30, 38, 78, 88, 98, 138, 146-155]
Grade retention	Grade retention	School records; Trial	Interview; Survey	Mental Health Supplement to the Ontario Health Survey; School Status and Improvement Report; Survey on Health and Consumption during the Day of Defense Preparation; Survey on Health and Consumption	Self-report	[44, 46, 58, 86, 92, 99, 136, 156, 191, 192]
Presenteeism at school	Inattention in class	Trial	Interview; Observation; Questionnaire	The Swanson, Kotkin, Agler, M-Flynn and Pelham Rating Scale; AddHealth Wave I in-home questionnaire; Child Behaviour Checklist; Self-Efficacy Questionnaire; Teacher Observation of Classroom Adaptation-Revised; Attention Problems scale of the Child Behaviour Checklist; Child Obsessive Compulsive Scale; Children's Adjustment Scale	Proxy: teacher; Self-report; Proxy: observer; Proxy: parent	[36, 42, 71, 119, 121, 124, 132, 138, 193-196]



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Measurement method						
Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	Fulfilment of after school responsibilities	Trial	Observation; Questionnaire; Survey	Child Obsessive Compulsive Impact Scale; Homework performance log; Data collection sheet; Homework Problem Checklist; AddHealth Wave 1 in-home questionnaire	Self-report; Proxy: parent; Other: observer; Proxy: teacher	[42, 49, 71]
	Fulfilment of school responsibilities	Trial	Survey; Questionnaire	Self-developed; Child Obsessive Compulsive Impact Scale; Liebowitz Social Anxiety Scale for Children and Adolescents; Teacher's Report Form; What About You; Revised Test Anxiety Scale \par	Self-report; Proxy: parent	[42, 59, 62, 94, 128, 147, 155, 193]
	School motivation	Trial	Interview; Questionnaire; Survey	Teacher's Report Form; Need for achievement scale; What About You; Communities that Care; Health Pathways Child Report; Utrecht Work Engagement Scale; Self-developed	Proxy: teacher; Self-report; Proxy: parent	[25, 38, 46, 51, 57, 59, 62, 107, 147, 197, 198]
	School participation	Trial	Questionnaire	Student Perceptions of School Scale	Self-report	[199]
	Tardiness	School records; Trial	Questionnaire	Child Obsessive Compulsive Impact Scale	Self-report; Proxy: parent	[28, 39, 42, 56, 89]
Reduced school competence	Attention span	Trial	Questionnaire	Wechsler Intelligence Scale for Children revised	Self-report	[200]
	General school competence	Trial	Interview; Questionnaire; Survey	Wechsler Intelligence Scale for Children-Revised; Dysregulation Inventory; Learning problems subscale from Teacher-Child Rating Scale; Academic Competence subscale from the Social Skills Rating System- Teacher version; Full Scale IQ, Verbal IQ and Performance IQ scales from Wechsler Abbreviated Scale for Intelligence; Social Skills Rating System: Teacher version; Soziale Integration, Klassenklima und Selbstkonzept der Schulfähigkeit (Social integration, classroom Climate and Self-concept of School Readiness); Children's Impairment Rating Scale; Child Behaviour Checklist; Brief Impairment Scale; Child and Adolescent Functional Assessment Scale	Self-report; Proxy: teacher	[48, 66, 119, 130, 134, 135, 201-203]
	Intrusion resistance	NR	NR	NR	NR	[200]
	Language impairment	Trial	Survey	Wechsler Intelligence Scale for Children-revised subset of Similarities; Wechsler Intelligence Scale for Children-revised subset of Vocabulary; Wechsler Intelligence Scale for Children-revised subset of Information; Boston Naming Test; Wechsler Abbreviated Scale of Intelligence	Self-report	[200]



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Measurement method

Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	Memory	Trial	Questionnaire; Survey	California Verbal Learning Test- Children's version; Perceived academic competence	Self-report	[200]
	Visuospatial impairment	Trial	Survey	Wechsler Memory Scale Visual Reproduction; Embedded Figures Test; Wechsler Intelligence Scale for Children; Embedded Figures Test; Booklet Category Test- shortened research form	Self-report	[200]
Salary of school staff	School nurse salary	NR	NR	NR	NR	[160]
	Teacher salary	NR	NR	NR	NR	[160]
School atmosphere	Engagement in social activities at school	Trial	Questionnaire	Child Obsessive Compulsive Impact Scale; Child Obsessive Compulsive Impact Scale	Self-report; Proxy: parent	[42]
	Exclusion at school	Trial	Interview; Questionnaire; Survey	Soziale Integration, Klassenklima und Selbstkonzept der Schulfähigkeit (Social integration, classroom Climate and Self-concept of School Readiness); Client Service Receipt interview for Childhood; British Child and Adolescent Mental Health Survey 2004 and 2007; Child Social Preference Scale	Self-report; Proxy: teacher; Proxy: mother; Proxy: parent	[40, 161, 164, 203-205]
	Feels safe in school	Trial	Questionnaire	Self-developed; CSAP Student Survey	Self-report	[123, 128, 193]
	General school atmosphere	Trial	Observation; Questionnaire; Survey	Self-developed; The Climate Survey; Soziale Integration, Klassenklima und Selbstkonzept der Schulfähigkeit (Social integration, classroom Climate and Self-concept of School Readiness); Classroom Rating; Child and Adolescent Social Support Scale 2000	Self-report; Proxy: teacher; Proxy: observer	[36, 78, 121, 158, 203, 206-210]
	Negative experiences at school	Trial	Questionnaire; Survey	School Hassles Scale; Self-developed; School Success Profile; Youth, Culture, and Competence Hassles Battery	Self-report; Proxy: teacher	[128, 193, 203, 209, 211, 212]
	Parent involvement in school	Trial	Questionnaire	Parent Involvement in School	Proxy: parent	[123]
	Peer relationships at school	Trial	Interview; Questionnaire; Survey	Child Peer Social Skills questionnaire; Child Obsessive Compulsive Impact Scale; Children's Impairment Rating Scale; Teacher Ratings of Student Adjustment; Preadolescent Adjustment Scale; Walker-McConnell Scale of Social Competence and School Adjustment; Relationships with Peers and School; Adapted AddHealth Wave I in-home questionnaire; Popularity subscale from the Ratings of Children's Behavior Scale	Self-report; Proxy: parent; Proxy: teacher; Proxy: peers; Proxy: classroom peer	[42, 66, 71, 78, 120, 121, 130, 148, 205, 213]



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Measurement method						
Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	School bonding	Trial	Interview; Questionnaire; Survey	Kentucky School Bonding; Self-developed; What About You	Self-report	[46, 62, 123]
	School satisfaction	Trial	Questionnaire; Survey	Teacher's Report Form; Self-developed	Proxy: teacher; Self-report	[38, 128, 147, 213]
	Teacher relationships	Trial	Questionnaire; Survey	Student-Teacher Relationship Scale; Social Relations Problems subscale from Teacher Observation of Classroom Adaptation- Revised; Relationships with Peers and School; Self-developed; Conflict subscale from Student Teacher Relationship Scale; Closeness subscale from Student teacher Relationship Scale; Dependency subscale from Student Teacher Relationship Scale; Preadolescent Adjustment Scale; Self-developed; Adapted AddHealth Wave I in-home questionnaire; Teacher Ratings of Student Adjustment; Healthy Pathways Child Report	Proxy: teacher; Self-report	[57, 71, 123, 128, 130, 132, 148, 213, 215]
School attendance	Excused absence from school	School records				[160, 216, 217]
	Unexcused absence from school	Administrative records; Trial	Interview; Questionnaire; Survey	Adapted AddHealth; Extended version of the Diagnostic Interview Schedule for Children Version IV impact; Child and Adolescent Psychiatric Assessment; Communities that Care; Self-developed; Add Health Study; 3-City Study; Child and Adolescent Psychiatric Assessment	Self-report; Proxy: caregiver; Proxy: parent	[28, 35, 36, 44, 56, 71, 74, 79, 114, 128, 218, 219]
	Undefined absence from school	Administrative records; Clinical database; School records; Trial	Interview; Survey	Case file extraction form; World Mental Health version of the Adolescent Composite International Diagnostic Interview	Proxy: caregiver; Self-report; Proxy: family members; Proxy: other	[28, 29, 34, 37, 39, 42, 44, 50, 56, 57, 64, 77-79, 86-96]
School mobility	School mobility	School records	Questionnaire	Check & Connect Monitoring Sheet	Proxy: researcher	[96]
School readiness	General school readiness	Trial	Survey	Self-developed	Proxy: teacher	[78]
	School readiness: behavioural issues	Trial	Survey	Teacher Observation of Child Adjustment-Revised	Proxy: teacher	[58]
	School readiness: cognitive ability	Trial	Survey	Wechsler Intelligence Scales for Children-Revised	Self-report	[58]
	School readiness: inattention	Trial	Survey	Child Behavior Checklist- Teacher Report Form	Self-report	[58]



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Measurement method

Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	School readiness: reading ability	Trial	Survey	Woodcock-Johnson Psycho-Educational Battery-Revised	Self-report	[58]
Social competence at school	Aggression at school	Clinical database; School records; Trial	Interview; Observation; Questionnaire; Survey	Interpersonal Process Code; Peer Assessment Inventory; Teacher Assessment of Social Behavior Questionnaire; Children's Social Behavior Scale- Teacher Form; Child Behavior Checklist; Iowa Conner's Teacher Rating Scale; Social Problem Solving Measure; Teacher Observation of Classroom Adaption-Revised; Proactive-Responsive Scale; Self-developed; PRIDE survey; Behavioral Improvement Aggression subscale from the Teacher Ratings on the Child Behavior Checklist; CSAP Student Survey; Dysregulation Inventory	Proxy: observer; Proxy: peers; Proxy: teacher; Proxy: staff members; Self-report; Proxy: classroom peer	[34, 56, 66, 81, 84, 117-129]
	Authority acceptance at school	Trial	Interview; Questionnaire	Children's Adjustment Scale; Authority Acceptance scale from the Teacher Observation of Classroom Adaptation-Revised; Teacher Observation of Classroom Adaptation-Revised	Proxy: teacher	[84, 121, 132]
	Disruptive behaviour at school	Trial	Interview; Questionnaire; Observation	Iowa Conner's Teacher Rating Scale; Acting out behavior problem subscale of the Teacher-Child Rating Scale; Client Service Receipt Interview for Childhood; Teacher's Report Form	Proxy: teacher; Proxy: observer; Proxy: mother; Proxy: classroom peer	[76, 121, 122, 135, 148, 161, 194, 195]
	Emotion expression and recognition at school	Trial	Interview; Questionnaire	Child Behavior Checklist; Strengths and Difficulties Questionnaire; Emotion Recognition Questionnaire; Interview for Emotional Experience; Student's Achievement Relevant Actions in the Classroom	Self-report	[48, 66, 136]
	Externalizing behavioural problems at school	Trial	Questionnaire	Teacher's Report Form; Behavior Assessment Scale for Children; Second Edition Teacher Rating Scale; Conners' Teacher Rating Scale	Proxy: teacher	[84, 138, 220]
	Internalizing behavioural problems at school	Trial	Questionnaire	Behavior Assessment Scale for Children; Second Edition Teacher Rating Scale; Teacher's Report Form; Conners' Teacher Rating Scale	Proxy: teacher	[138, 220]



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Measurement method						
Cost item category	Cost item	Data source	Method	RUM name, if applicable	Administration	Source
	Social adjustment at school	Trial	Interview; Questionnaire; Survey	Child Behavior Checklist; Children's Adjustment Scale; Peer Assessment Inventory; What About You; Perceived Peer Behavior Norms; PROMIS Peer Relationships Short Form item bank; Teacher Observation of Classroom Adaptation-Revised; Child Behavior Checklist-Teacher Report; Outcome Expectations Questionnaire; Strengths and Difficulties Questionnaire; Social Health Profile; Perceived social competence; Social Relations Problems subscale from the Teacher Observation of Classroom Adaptation-Revised; Social Competence Scale for Teachers; Social Skills Rating System- Teacher version; Shyness/anxiousness subscale from the Teacher Child Rating Scale; What About You; Social Adjustment Scale; Attributional measure; Teacher Ratings of Adaptive Behavior; Teacher-Child Rating Scale; School scale from the Preadolescent Adjustment Scale; Behavior Assessment Scale for Children, Second Edition Teacher Rating Scale-Child; Teacher Ratings of Maladaptive Behavior	Proxy: teacher; Proxy: peers; Self-report; Proxy: classroom peer	[51, 53, 60, 62, 66, 84, 89, 118, 119, 121, 123, 124, 132-138]
	General behavioural problems at school	Trial	Questionnaire; Survey	Conners' Teacher Rating Scale; What About You; Teacher Ratings of Child Behavior Change; Teacher Observation of Classroom Adaptation Revised; Child Behavior Checklist- Teacher Report; Two indicators from the Achenbach Youth Self Report; Teacher's Report Form; Case file extraction form; Children's Impairment Rating Scale; Socially appropriate behavior subscale from Ratings of Children's Behavior Scale; Behavior Assessment Scale for Children; Second Edition Teacher Rating Scale; Social Skills Rating System; Teacher version	Proxy: teacher; Self-report; Proxy: other; Proxy: parent	[47, 51, 62, 64, 68, 84, 113, 130, 134, 138, 147, 205, 220]
Teacher attendance	Teacher absenteeism	Trial	Questionnaire; Survey	Teacher Survey Questionnaire	Self-report; Proxy: teacher	[92]
	Teacher presenteeism	School records				[160, 217, 221]

Table A. Framework of identified educational costs and benefits and their reported measurement method.

