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Towards a More Inclusive Society: The Social Return on Investment (SROI) of an Innovative Ankle–Foot Orthosis for Hemiplegic Children

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Abstract: Hemiplegia is a form of disability that affects one side of the body and has a prevalence of 0.5–0.7 per 1000 live births. It has consequences not only at the medical level but also on psychological, cognitive, and social aspects, and it prevents children from social participation, especially in sports settings. The studies demonstrating the social impact of sports on the hemiplegic population and, in particular, children, are limited. In addition, previous evaluations of healthcare sports initiatives in the hemiplegic population are not available, and traditional methods of evaluation, which are mostly focused on economic outcomes, are not applicable. Thus, this article employs the social return on investment (SROI) methodology, which is able to determine the socio-economic impacts of an initiative, to evaluate the impact of an innovative ankle–foot orthosis (AFO) for hemiplegic children that was created to promote the possibility of "sports for all". The model was designed with the involvement of stakeholders in all the phases and with mixed methods to assess the input, outcomes, and impact indicators. The final SROI, computed for a time horizon of three years and with a focus on the Lombardy Region, was equal to 3.265:1. Based on this result, the initiative turned out to be worthy of investment.

Keywords: SROI; healthcare; sport; disability; hemiplegia; orthosis

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1. Introduction

More than a billion people in the world are affected by a disability, and this number is going to increase in the future as a result of the aging population and an increase in the number of chronic patients [1].

Disability is not only a purely medical condition; according to the International Classification of Functioning, Disability, and Health [1], it is a situation that must be analyzed in a wider social, personal, and environmental context.

Nonetheless, Article 25 of the UN Convention on the Rights of Persons with Disabilities (CRPD) states that persons with disabilities must, without any distinction or discrimination, have access to the highest health standard; they usually have weaker health and social conditions in comparison to those without impairments (https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-25-health.html. accessed on 14 February 2023).

Hemiplegia is a diffused form of infantile cerebral palsy. It is a disability that affects one side of the body and it has a prevalence of 0.5–0.7 per 1000 live births [2].

Hemiplegic children show muscle tone problems, muscular retractions, bone deformities, and sometimes cognitive problems and seizures [2]. Their disease prevents them from social participation, especially in sports settings where the orthopedic orthosis they wear is not adequate.

Social exclusion and physical inactivity are risk factors that must be reduced, as is also evident by the 15% target reduction of inactivity by 2030 imposed by the WHO [3].

For these reasons, the authors decided to concentrate on the case of children with hemiplegia, considering the opportunity to invest in sports activities for them strongly valuable. Indeed, when taking action in the first stage of people's lives, there is much more of a possibility to improve their condition in the long term.

The literature, as well as governments and international institutions all around the world, has recognized the social impact generated by sports activities on health, jobs and education, and social capital. The healthcare field is one of the most addressed in the literature, especially regarding physical health. In the general population, according to the recommendations by the US Department of Health and Human Services [4] and the WHO [3], the main physical benefits are related to the reduction of the risk of secondary diseases, while for people with disabilities and children with hemiplegia, the attention has mostly been focused on ambulation and motor improvements [5–11]. Concerning the psychological health area, improvements in depression, anxiety, self-perception, and emotional well-being have been recognized in all populations [5–7,11–14]. For the hemiplegic and disabled categories, enhancements in the acceptance of their own body, personality, and peculiarity have also been considered [9,15]. Shifting the focus to jobs and education, less evidence is available. For the general population, links between sports and academic participation, school results, and the opportunity to be part of job, training, and volunteer opportunities seemed to be affected [16]. For children with cerebral palsy, evidence of school participation, attention disorder syndromes, and attention deficit hyperactivity disorder were available [10]. Disabled people are usually at higher risk of social stigma. Sports participation, through the creation of an inclusive environment, helps them disclose more about themselves, fear less social judgment, and increase community awareness of disability [5–7,13,15,17,18].

In conclusion, a good amount of evidence is available for all populations regarding the physical and psychological health domains. However, there is little evidence regarding jobs, education, and social capital for people with disabilities and, most of all, for children with cerebral palsy.

Previous evaluations of healthcare sports initiatives in the hemiplegic population are not available in the literature, and traditional methods that focus on economic outcomes are not applicable.

In 2019, the GIMBE Italian observatory on Evidence for health published a report about the NHS budget that, from 2010 to 2019 recorded a decrease of 37 billion EUR [19]. Budget reduction, alongside patient needs, requires more attention for the proper initiatives to be financed and new methodologies that also take into account social and environmental outcomes. Many techniques are used to assess whether medical technologies offer good value for money. Among the various methodologies, the social return on investment was identified, since it considers a broader definition of impact, including economic, environmental, and social consequences [20]. The social return on investment methodology was identified as a result of the need to consider a broader definition of impact.

Interest in assessing the social impact of public health interventions is increasing, but further case studies are necessary to expand this field [21].

The social return on investment methodology arose from the need to take into account a broader definition of impact. In recent years, the number of applications has increased, particularly in health settings [22]. In analyzing previous studies in sports, healthcare, childhood, and disability settings, it is evident that the identified stakeholders have been involved in interviews, focus groups, and questionnaires. In the input analysis, not only have financial costs been analyzed and considered, but given the social mission of the studies, also those related to donations and in-kind resources, such as volunteers, have been counted [23–29]. Outcomes have mainly been differentiated depending on the types of stakeholders and interventions. Concerning the direct beneficiaries, physical and psychological improvements have been the most important outcomes in the studies analyzed.

In addition, in sports settings [23,25,30], all the other benefits related to the social impact of sports have also been considered, while in childhood programs [26,31,32] educational outcomes have been emphasized. Other relevant outcomes considered volunteers and families. Volunteers have shown knowledge, competence, and skill improvement, while families have reported a reduction in the burden of care. No consensus has been reached on the definition of the financial proxies used to monetize the above-mentioned outcomes. The studies' durations have been set between six months and two years for the majority of them [25–27,29,31–34], but information about the deadweight, attribution, displacement, drop-off, and discount rate has not always been available or detailed.

Regarding the SROI results, these are the main findings in the literature considered:

- Sports interventions have ranged between 2:1 and 5:1 [23,25,30];
- Healthcare interventions have ranged between 3:1 and 13:1 [24,28,29,33];
- Disability interventions have ranged between 1:1 and 15:1 [27,34].

Sensitivity analyses have frequently been used but there has been no consensus on which parameters to vary. In conclusion, in sports settings, additional research is needed, and few case studies are currently available [35], creating a scientific gap to be filled with new knowledge.

The findings highlight the need for additional evidence to support the social impact of sports on the cerebral palsy and hemiplegia population. Therefore, further studies in sports settings are needed [36] to improve these scientific findings. In addition, social inclusion and social capital have been poorly addressed by the authors and need to be further studied.

Finally, there are no SROI studies in the literature that have addressed a health sports intervention for children with hemiplegia.

Finally, no SROI studies dealing with a healthcare sports intervention for hemiplegic children are available in the literature.

So, the aim of this study was to apply the SROI method to evaluate the effects of an innovative device that enables sports activities on hemiplegic patients. In fact, the authors applied this technique to evaluate the social impact of an innovative ankle–foot orthosis (AFO) for children with hemiplegia. This orthosis is the result of a project called enGIneering For sporT for all (GIFT) carried out at Politecnico di Milano. GIFT is the winning project of the Polisocial Award 2019 (carried out by Politecnico di Milano), an internal competition developed by Politecnico di Milano to fund scientific projects with a social purpose. As participation in sports is central to the lives of all people, including people with disabilities, an intervention for their inclusion seemed necessary. In this context, GIFT has developed a new generation of ankle–foot orthoses (AFO) that enable children with hemiplegia to participate in and integrate into sports. This is because standard orthoses do not allow children to play sports in the right way. The long-term goal of the project is to promote the possibility of "sports for all'. A total of 19 hemiplegic children participated in the research; given the great potential of this innovative AFO, the authors expected that the SROI calculations would provide positive results and thus a positive impact on society.

Given the urgent need to create a holistic model to help public health facilities make decisions about their most vulnerable patients, this model could be used by a health facility to inform their decision-making processes and calculate the value for money of equipment that enables sports initiatives for the most vulnerable patients, children with hemiplegia.

2. Materials and Methods

To reach the objective of this research, the authors first performed two scoping reviews to understand the social impact of sports and the use of the SROI methodology in healthcare, sport, disability, and childhood settings. Then, they applied the SROI methodology to the GIFT case.

2.1. Scoping Review

To better investigate the social impact of sports activities on health, jobs and education, and social capital, the authors carried out a scoping review using the snowball sampling methodology to analyze three target populations: non-disabled people, people with disabilities, and children with hemiplegia. Due to the low availability of high-quality studies for the hemiplegic population, the general case of cerebral palsy was considered. Although the number of articles about the social impact of sports was almost uniform for each target population, the completeness and quality of the documents decrease from the general population to children with cerebral palsy.

Second, to better understand the employment of the SROI methodology in healthcare, sports, disability, and childhood settings, the authors carried out a scoping review.

The scientific evidence was mainly gathered from Scopus, PubMed, and Google Scholar. Additionally, data and international recommendations about sports and disability were retrieved from the ISTAT database and official World Health Organization documents, respectively.

2.2. Model Design

To carry out the SROI calculation of GIFT, *A guide to social return on investment* by Nicholls et al. [37] was employed as a reference point since it is the most comprehensive manual for the application and analysis of the SROI methodology. In particular, it includes a detailed description of the six stages that practitioners have to follow to perform an appropriate SROI analysis

In this section, an explanation of these six phases is provided.

Establishing scope and identifying stakeholders

In the first phase of the SROI methodology, the scope of the analysis, the stakeholders involved, and the methods used for their involvement need to be clarified.

With the scope, the perimeter of the analysis is defined through the inclusion of information on the purpose, the audience, the background, the resources, the authors of the analysis, the activities of the analysis, the time horizon, and the type of analysis (forecast or evaluation).

For the stakeholders' identification, all those who experience a material change have to be included.

After the identification, involvement is crucial. There are different ways to collect data; focus groups, interviews, and surveys are only some examples.

The first way in which the authors involved stakeholders was using questionnaires to understand the context in which the hemiplegic child lived and the recognized sports benefits. The authors obtained 30 answers from sports associations, 59 from families, and 113 from primary school teachers. The questionnaires for the sports associations were organized into two parts. The first part included general information on the trainers and the associated sports association. The second one determined the experience of the trainers with hemiplegia and other motor disabilities. The questionnaires for the families included general questions about the parents and their experience and attitude towards the sports participation of hemiplegic children, the barriers to the growth of their children, their opinion on the orthosis used, and their relationship with sports associations, oratories, and rehabilitation centers. The questionnaires for the teachers covered questions about the experience of the teacher for child management during physical education lessons, their attitude towards sports practice and inclusion of the children, the effects of sports practice and inclusion on students, their relationship with the families, and the complexity of the growth of the children.

Mapping outcomes

With the stakeholders' involvement, the impact map is identified. Starting with the valorization of the input used for the project (both monetized and non-monetized), the outputs are identified and, finally, the outcomes expected from the activity are projected.

Evidencing outcomes and giving them a value

The third stage starts with the definition of outcome indicators for the identification and quantification of the changes. Gathering data is therefore crucial, and different methods can be used, such as interviews, workshops, and focus groups.

The duration and, finally, the value for each outcome must be defined. Some outcomes are easier to monetize because their market value is directly available, while others do not and appropriate proxies have to be selected. In many cases, the values are also determined from the existing literature, especially when there is limited evidence to identify them.

For these latter outcomes, different techniques are available, but the most used are stated preference and contingent valuation or revealed preference.

The first method is based on an evaluation of the willingness to pay (WTP) or willingness to accept (WTA), while the second assesses the value starting with goods whose price is easily available.

Establishing impact

To reasonably and consistently compute the final social impact generated, some coefficients need to be evaluated:

- Deadweight: the number of outcomes, expressed as a percentage, that would have been reached even if the organization had not put in place its activities or projects; the number of outcomes attributable to the projected outcomes decreases as the deadweight percentage increases;
- Attribution: definition of the number of outcomes, expressed as a percentage, caused by other organizations or actors;
- Displacement: the extent to which one outcome has displaced other outcomes;
- Drop-off: evaluates the degradation of an outcome over time.

After considering all these parameters, the final impact is computed.

Calculating the SROI

If the time horizon chosen for the analysis is higher than 1 year, the yearly value of impacts and inputs needs to be computed. Then, since some values are related to future times, they need to be discounted with an appropriate discount rate. In this case, a time horizon of three years was chosen since SROI calculations are typically carried out for 1 to 5 years [38].

The choice of the rate is still under debate nowadays, but in *The Green Book* of the HM Treasury it is suggested 3.5% for the public sector.

At this point, all the information needed to compute the final ratio is available and, based on the preferred convention, the SROI or Net SROI can be evaluated. The difference between the two lies in the numerator: in the first case, the present value is used, while in the second, the net present value is desirable.

To examine the uncertainty and evaluate the possible result change, a sensitivity analysis has to be made. The model is indeed built upon assumptions; consequently, a change in them leads to a change in the final ratio. Usually, the sensitivity analysis is based on a change in the parameters to compute the impact (deadweight, attribution, and drop-off), financial proxies, the number of outcomes, or the value of the non-financial impact.

Reporting, using, and embedding

This final stage refers to communication, the adoption of changes, and assurance.

In the disclosure, it is important not only to present the results of the analysis but also all the intermediate stages and assumptions used to create the model.

In conclusion, all the information about the procedure and the information disclosed must be checked.

2.3. Model Validation

Stakeholder involvement is one of the main SROI principles according to *A guide to social return on investment* by Nicholls et al. [37]. To validate the model and the assumptions made, key stakeholders involved in the GIFT project were consulted in three ways: inter-

views, focus groups, and questionnaires. These techniques were used to collect data and validate each step of the methodology.

Concerning the interviews, the authors video-interviewed 44 stakeholders; these lasted around half an hour. The authors employed video interviews with the objective of better empathizing with the interviewees and understanding their emotions. Interviews were carried out from July 2020 to March 2021. In Table 1, the main characteristics of the sample are presented.

Table 1. Categories of stakeholders.

Categories of Stakeholders	
Parents of Hemiplegic children	26
Primary school teachers	8
Physical Education Teachers and Trainers	5
Physiotherapists	5

The "parents of hemiplegic children" category included both parents of the children involved in the project and other parents of hemiplegic children.

The interviews covered questions about the experience and training developed by the people directly involved with the children, the support received during the activities, the feelings and relationships, the activities during a typical day of life, the lesson or training program, the challenges, the best strategies and the benefits derived from the inclusion and participation in sports activities.

Finally, the authors conducted two focus groups—one with primary school teachers, physical education teachers, trainers, and physiotherapists, and one with parents of hemiplegic children—to validate the results. Both of the focus groups involved between 6 and 8 stakeholders. The objective of these focus groups was to collect information on the changes experienced by the stakeholders directly involved during the pilot project. In addition, information on the impact factors, such as deadweight and attribution, was collected. The parents' experiences were used to assess and validate the changes noticed by them and their children, while the testimony of the teachers and trainers was elaborated to verify the outcomes for them, the children, and their classmates or peers.

Then, the authors sent questionnaires to the participants of the focus groups in order to validate the financial proxies.

At the end of the analysis, the model was presented in front of the funders, partners, and stakeholders of the initiative to reach a comprehensive consensus.

3. Results

In this section, the main findings from the SROI calculation, including details about the model design and validation, are reported briefly.

3.1. Establishing Scope and Identifying Stakeholders

The authors performed a forecasted SROI analysis on the social impact generated by the GIFT orthosis in the Lombardy region within a timespan of three years. As the project was carried out by Politecnico di Milano, with the endorsement of trustworthy partners, the focus was on the Lombardy region. The question that guided the analysis can be summarized as this: "Why should the Lombardy Region pay for the development and implementation of a new medical device that allows children with disabilities, in particular with hemiplegia, to play sports and actively participate in the physical education lessons?" The target population, according to the purpose of the GIFT project, was children with hemiplegia between 5 and 18 years old, in the first two levels of the Gross Motor Function Scale, and willing to adopt the GIFT orthosis. Given the wider social impact generated by the project, also families, physical education teachers, trainers, peers, and the Lombardy Region were included.

The healthcare system also had to be included. Stakeholders were consulted at all stages of the methodology with mixed methods: questionaries, interviews, and focus groups.

3.2. Mapping Outcomes

Two input providers were identified: the Lombardy Region Healthcare System and families. The former was responsible for all public services needed (orthosis, complex outpatient macroactivities (MAC), and psychiatric visit cost), while the latter was charged for private services (private orthosis and visits). In addition, families' dedicated time was evaluated as an opportunistic cost. The costs associated with the sports activities were not considered because they are not differential compared to the base case of hemiplegic children with basic orthoses that do not allow them to perform sports in a proper way. Outcomes were assessed using focus groups and interviews. For the direct beneficiaries, the benefits of the sports were considered; for other stakeholders, psychosocial and competency improvements were evaluated, as well as better physical health and cost savings (Table 1).

3.3. Evidencing Outcomes and Giving Them a Value

Each outcome was quantified and monetized with the use of questionnaires to assess stakeholders' WTP with the exception of the Lombardy Region's outcome, which was assessed as a cost-saving. Details about the outcomes and proxies are shown in Table 2.

Table 2. Outcome computation.

Stakeholder	Outcome	Indicator	Proxy	Outcome Value
Beneficiaries—Children with Hemiplegia	Improvements in motor condition	Percentage of children who have experienced motor skills improvements	Willingness to pay for improved motor condition	Willingness to pay × Number of beneficiaries × Percentage of children who have experienced motor skills improvements
	Improvements in psychological conditions	Percentage of children who have experienced psychological improvements	Willingness to pay for improved psychological conditions	Willingness to pay × Number of beneficiaries × Percentage of children who have experienced psychological improvements
	Improvement in cognitive skills	Percentage of children who have experienced cognitive improvements	Willingness to pay for improved cognitive skills	Willingness to pay × Number of beneficiaries × Percentage of children who have experienced cognitive improvements
	Improvement in social skills	Percentage of children who have experienced social improvements	Willingness to pay for improved social skills	Willingness to pay × Number of beneficiaries × Percentage of children who have experienced social improvements
Lombardy region	Reduction in muscle–tendon contractions and bone deformities	Number of reduced lower-limb surgery interventions	Surgery and intensive post-surgical treatments costs	Surgery and intensive post-surgical treatments costs × Number of reduced lower-limb surgery interventions

Table 2. *Cont.*

Stakeholder	Outcome	Indicator	Proxy	Outcome Value
Families	Improvement in family relationship	Percentage of families who have experienced family improvements	Willingness to pay for improved relationships	Willingness to pay × Number of families × Percentage of families who have experienced family improvements
	Improvement in psychological conditions	Percentage of parents who have experienced psychological improvements	Willingness to pay for the improved psychological condition	Willingness to pay × Number of parents × Percentage of parents who have experienced psychological improvements
	Improvement in social skills	Percentage of parents who have experienced social improvements	Willingness to pay for improved social skills	Willingness to pay × Number of parents × Percentage of families who have experienced social improvements
Physical Education Teachers and Trainers	Improvements in competencies	Percentage of teachers/trainers who have experienced improvements in competencies	Willingness to pay for improvements in competencies	Willingness to pay × Number of physical education teachers and trainers × Percentage of teachers/trainers who have experienced improvements in competencies
	Improvements in communication and social skills	Percentage of teachers/trainers who experienced communication and social improvements	Willingness to pay for improvements in communication and social skills	Willingness to pay × Number of physical education teachers and trainers × Percentage of teachers/trainers who experienced communication and social improvements
	Improvements in psychological conditions	Percentage of teachers/trainers who have experienced psychological improvements	Willingness to pay for psychological improvements	Willingness to pay × Number of physical education teachers and trainers × Percentage of teachers/trainers who have experienced psychological improvements
Classmates and peers	Improvements in social and inclusive skills	Percentage of peers who have experienced social improvements	Willingness to pay for improved social skills	Willingness to pay × Number of peers × Percentage of peers who have experienced social improvements

In the next section, a description of the various outcomes is provided.

Beneficiaries—Children with Hemiplegia

In relation to the beneficiaries of the intervention, improvements in motor, psychological, cognitive, and social skills were noted. In fact, the focus groups confirmed the possibility of achieving motor improvements when compared to the benefits offered by current orthopedic devices. This can lead to psychological benefits, which was considered one of the fundamental results, also referring to what emerged from the literature. Then, teachers in particular pointed out how concentration and attention changed and cognitive abilities improved, and, as expected at the beginning, all participants agreed on the improvement in social integration.

Lombardy Region

Reductions in muscle–tendon contractions and bone deformities were noted for the Lombardy region. Hemiplegic children risk muscle–tendon contractions that require accommodation, surgical interventions, and rehabilitation therapies that affect the cost of the health system. Physical activity and the use of orthosis could be anticipatory strategies to reduce the number of surgeries required, providing cost savings to the National Health Service.

Families

During the focus group activities, families stated that they were more engaged and focused on their children's problems, and the better conditions for both children and parents led to an improvement in relationships within the family. For this reason, improvement in family relationships was selected as an outcome. In addition, the parents of disabled children are, on average, 20% to 25% more stressed than others [39]. The burden of caregiving, as well as everyday difficulties, exacerbates the psychological problems of family members.

The opportunity to exercise and improve the physical and psychological conditions of the children could reduce the psychological stress felt by the parents and lead to psychological improvement.

Parents also showed significant improvements in their mental health. They reported feeling more confident about the future, calmer, happier, more relaxed, and less anxious. Therefore, improvement in mental health was cited as an outcome. The last outcome considered was an improvement in social skills, as the burden of caregiving, higher stress levels, and the lower autonomy of their children usually prevent parents from actively participating in social activities. During the focus group, parents recognized that the GIFT orthosis and the opportunity to play sports allowed them to socialize and be exposed to parents of other children of the same age.

Physical Education Teachers and Trainers

Three types of outcomes were identified for these actors. First, there was an improvement in competencies, as the children with hemiplegia were to be assisted in sports participation thanks to the orthosis, reducing the need for specific skills. During the focus group activity, the stakeholders confirmed the possibility of developing a more focused methodology, better planning of activities based on specific needs, and positive personal and professional enrichment. Improvements in communication and social skills were also considered important. Children with disabilities are usually excluded from sports and recreational activities, so the GIFT orthosis was developed to promote their sports integration. The initiative was intended to improve the social skills of teachers and coaches through the orthosis and the distribution of instructions. During the focus group activity, they also recognized a higher awareness of diversity management. Finally, improvements in psychological conditions were observed: the creation of an inclusive environment and the higher motor performance of the children involved led to a sense of satisfaction among the teachers and trainers, which in turn brought psychological benefits. In addition, the use of orthosis reduced the anxiety and fears often experienced by these actors.

Classmates and peers

Classmates and peers were identified as indirect beneficiaries of the initiative, and improvements in social and integrative skills were noted. The creation of an inclusive environment, both at school and in recreational activities, could have a positive impact on the social and inclusive skills of children who are in close contact with direct beneficiaries.

3.4. Establishing Impact

Estimations about the deadweight, attribution, and drop-off were defined based on the stakeholders' involvement and the literature analysis; these are reported in Table 3. No displacement was estimated.

Table 3. Deadweight, attribution, and drop-off estimations.

Stakeholder	Outcomes	Deadweight	Attribution	Drop-Off
Beneficiaries—Children with Hemiplegia	Improvements in motor conditions	20%	60%	20%
	Improvements in psychological conditions	30%	60%	20%
	Improvement in cognitive skills	40%	40%	20%

Table 3. *Cont.*

Stakeholder	Outcomes	Deadweight	Attribution	Drop-Off
	Improvement in social skills	20%	60%	20%
Lombardy region	Reduction in muscle–tendon contractions and bone deformities	0%	95%	10%
Families	Improvement in familiar relationship	30%	60%	50%
	Improvement in psychological conditions	30%	60%	50%
	Improvement in social skills	30%	60%	50%
Physical Education Teachers and Trainers	Improvements in competencies	20%	100%	20%
	Improvements in communication and social skills	60%	60%	40%
	Improvements in psychological conditions	80%	60%	40%
Classmates and peers	Improvements in social and inclusive skills	50%	50%	40%

3.5. Calculating the SROI

The HM Treasury *Green Book*'s [40] recommended discount rate of 3.5% for public initiatives was selected. The impacts and inputs were discounted with the discount rate chosen, and the values along the entire timespan are reported in Table 4.

Table 4. SROI computation.

	Year 1	Year 2	Year 3	Total
Discount	$(1 + 3.5\%)^1$	$(1 + 3.5\%)^2$	$(1 + 3.5\%)^3$	
Impact	EUR 3,004,665.29	EUR 1,836,529.19	EUR 1,164,740.74	EUR 6,005,935.21
Discounted impact	EUR 2,903,058.25	EUR 1,714,419.65	EUR 1,050,529.41	EUR 5,668,007.31
Inputs	EUR 756,861.35	EUR 446,635.84	EUR 651,410.03	EUR 1,854,907.23
Discounted inputs	EUR 731,267.01	EUR 416,939.34	EUR 587,534.53	EUR 1,735,740.87
SROI				3.265

The result of the SROI value for the GIFT orthosis was 3.265:1. This means that for each euro invested in the project, 3.265 in social value was generated.

Sensitivity analysis

To understand the possible SROI fluctuations as a consequence of hypothesis variations, the authors carried out two sensitivity analyses by changing the impact factors and adoption percentage.

- The deadweight, attribution, and drop-off estimates are some of the greatest uncertainties in the model. The authors consequently decided to worsen each value by 10%, as suggested by the study of Lozano and colleagues [32]. The SROI had a resulting value of 2.056, and the details about the yearly impacts are presented in Table 5:

Table 5. Impact computation—Sensitivity Analysis 1.

	Year 1	Year 2	Year 3	Total
Impact	EUR 2,090,284.08	EUR 1,083,531.00	EUR 595,625.87	EUR 3,769,440.96
Discounted impact	EUR 2,019,598.15	EUR 1,011,487.79	EUR 537,220.41	EUR 3,568,306.35

Overall, a decrease of 10% in all the impact parameters (deadweight, attribution, drop-off) resulted in a decrease of 37.04% in the final value.

- In the second case, the expected adoption percentage was varied, and the effects on SROI values are presented in Table 6.

Table 6. Impact computation—Sensitivity Analysis 2.

Adoption Percentage	SROI
71.43 % (baseline)	3.265
50%	3.274
20%	3.315

The number of hemiplegic children included in the analysis seemed to not influence the final result. The reason is that the calculation did not include the amount of the initial investment made by a producer of orthopedic devices and was not remunerated by the Lombardy Region Healthcare System, which was simply charged for the orthosis provision.

Overall, the SROI value ranged between 2.065 and 3.315, showing that in all analyses considered, the initiative was worthy of investment.

3.6. Reporting, Using, and Embedding

The authors presented the results obtained to the partner and the involved stakeholders at the end of the GIFT project, and the model was validated.

4. Discussion

This study consisted of an SROI computation of an ankle–foot orthosis that enables hemiplegic patients to participate in sports activities. In this way, this study contributes to the paucity of studies about the social impact of sports in this specific population, providing public healthcare with a methodology that includes a wider definition of impact.

No previous SROI studies on a healthcare sports intervention in children or adolescents with hemiplegia are available. Traditional decision-making processes tend to favor economic and financial measures, omitting all social and environmental outcomes that are more difficult to monetize but not less deserving of attention. Based on this need, the authors employed the SROI methodology to contribute, from a theoretical point of view, to this aim.

The final SROI resulted in a value of 3.265:1 for each euro invested in the orthosis distribution. Thus 3.265:1 of social value is expected to be generated.

Details about the SROI computation are presented in Table 7.

Table 7. SROI elaboration.

Discounted Impact	EUR 5,668,007.31
Discounted input	EUR 1,735,740.87
SROI	3.265

The results confirm what was predicted by the authors in the Introduction, meaning that the investment is worth it. Moreover, this is consistent with the main literature findings about SROI results for sports interventions, which ranged between 2:1 and 5:1.

It follows that this innovative ankle–foot orthosis for hemiplegic children can be of great benefit to all the involved stakeholders. As explained in the Results section, it is able to improve the physical, mental, and social condition of the actors included in the analysis.

The SROI model, developed starting with the GIFT real-life case study, can be generalized to wider fields and be useful to practitioners, academics, proponents of social projects, and public or government institutions.

Practitioners can benefit from the research since it provides a clear methodology for the computation of the social impact created by a particular healthcare sports project targeting children and adolescents with disabilities.

Initiatives with a strong social impact need appropriate methodologies that allow them to calculate and show not only the economic return but, above all, the social impact created.

When dealing with children and adolescents with disabilities, the traditional decision-making valuation methods do not allow for accounting for a wider definition of impact that is more useful for the less privileged categories.

For proponents of social projects, the innovative model is useful because the results can be shared with the potential funders of the initiative, convincing them to invest based on the results obtained and the social impact created not only on the direct beneficiaries but also on the entire society.

Similarly, public institutions or governments can use the methodology and the results achieved to evaluate alternative investment strategies and select the one with more social impact. In addition, the decision-making bodies of public or government institutions can benefit from the adoption of the methodology to evaluate interventions targeting their youngest and most vulnerable citizens.

In addition, this analysis may also be useful for orthopedic device developers, as it shows the value of investing in innovative orthoses that allow children with hemiplegia to participate in sports.

Finally, the obtained result of an SROI value of 3.265:1 can be used to convince the Lombardy Region Healthcare System to finance the distribution of the new orthosis, which can improve the lives of these children.

In addition to the benefits obtained during the decision-making processes, the model can also be used to communicate the results to society, thus demonstrating the value of the project and the expected social return.

Limitations

Unfortunately, the methodology involves the presence of four main limitations:

- Subjectivity: The model is based on a series of assumptions that depended heavily on the authors who performed the analysis. To limit this issue, a validation of the model based on stakeholders' involvement and an approval of the literature was carried out;
- Uncertainty: The forecasted nature of the analysis brings numerous uncertainties to the estimation of some parameters;
- Stakeholders' expertise: Involving stakeholders is one of the main principles of every SROI analysis; however, it could be complex due to their low expertise with the methodology;
- Relativity: The ratio is meaningful only if evaluated relatively. Furthermore, without procedure standardization, different SROI results have low comparability [41].

Another limitation of the study is that it included only 19 patients and was restricted to the Italian context. However, the methodology is not case-specific and can be generalized to wider samples also in the international context.

5. Conclusions

This study provides an SROI calculation of an innovative AFO for hemiplegic children. Since the literature lacks socio-economic evaluations of healthcare sports interventions for hemiplegic children, the research contributes to the state of the art. Moreover, it provides a methodology that practitioners could use to evaluate investments in innovative devices for disabled children.

This study employed a robust methodology enriched by interviewing the main stakeholders, which corroborates the reliability of the results.

Finally, considering the results of this study, the Lombardy Region Healthcare System could benefit from the distribution of orthosis in two different ways:

- Economically: Being active helps reduce the incidence of muscle–tendon contractions in children, with consequent cost savings for the public healthcare system;
- Socially: Playing sports impacts not only the physical conditions of the children but also their psychosocial and cognitive abilities. In addition, the people directly involved in the kids' lives also benefitted from the initiative.

If the Lombardy Region carried out a purely financial assessment, the ratio between the economic benefits and investment would be lower than 1, suggesting that the initiative is not worthy of investment. In detail, by considering the benefits and costs directly linked to the healthcare system, the ratio would be equal to 0.274:1. (Table 8).

Table 8. SROI computation for the Lombardy Region benefits and costs only.

Healthcare System Impact	EUR 335,123.204
Healthcare system investment	EUR 1,221,176.56
SROI	0.274

However, a public healthcare institution should take into account not only the economic benefits of an initiative but also the social impact created for its most vulnerable patients, their caregivers, and society overall.

Particularly, improvements in motor and psychological conditions, social capital, cognitive skills, and competencies were validated by the stakeholders involved, and overall, the impact created exceeded three times the investment.

The inclusion of multiple stakeholders and the social perspective adopted makes the SROI an appropriate methodology to account for a wider definition of impact and help public institutions in their decision-making processes.

In conclusion, the Lombardy Region Healthcare System should finance the initiative not for the possibility of obtaining economic benefits but for the social impact generated for society.

This study was the first attempt to perform an SROI evaluation in settings that are not traditionally analyzed; the model could be generalized to wider fields. In addition, it could be useful to both inform decision-making processes and to communicate the results to society, thus demonstrating the value of the project and the expected social return.

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