DIRECTION DE LA RECHERCHE, DES ÉTUDES, DE L'ÉVALUATION ET DES STATISTIQUES
MISSION RECHERCHE (MIRE)

Appel à projets permanent : **« Handicap et perte d'autonomie »**	
Recherche dirigée par **:** **Catherine ARNAUD, UMR INSERM U558, Université Paul Sabatier, Toulouse**	
Titre : **Déterminants environnementaux de la participation et de la qualité de vie d'adolescents en situation de handicap**	**Rapport final** **Novembre 2010**

Nom et prénom du responsable scientifique: ARNAUD Catherine

Durée du projet de recherche: **1 an**

Laboratoire responsable de la recherche : **UMR INSERM U558, Université Paul Sabatier, Toulouse**

TITRE DU PROJET :

Déterminants environnementaux de la participation et de la qualité de vie d'adolescents en situation de handicap

SOMMAIRE

RESUME DU PROJET

Ce projet a permis de financer la 3ème année de thèse d'épidémiologie de Mariane SENTENAC dont le sujet est l'étude des déterminants environnementaux, de la participation, de la qualité de vie d'adolescents en situation de handicap ou porteurs de maladies chroniques.

L'objectif spécifique de ce projet était de décrire et d'évaluer l'influence des composantes comportementales et attitudinales de l'environnement sur la qualité de vie et la participation chez des adolescents en situation de handicap.

La justification d'étudier ces facteurs repose sur le fait qu'ils sont modifiables et donc susceptibles de faire l'objet d'études d'interventions visant à les améliorer. A terme, nous pensons qu'une modification des attitudes et des comportements pourrait conduire à une meilleure intégration des adolescents en situation de handicap et une amélioration de leur bien être.

Cette dernière année de thèse a été consacrée à la valorisation de cette problématique par l'écriture d'articles scientifiques, la diffusion de ces résultats, et la préparation de nouvelles perspectives en lien avec cette problématique.

RAPPEL DU CONTEXTE DE LA RECHERCHE

Différentes équipes se sont intéressées ces dernières années à la qualité de vie (QdV) et la participation d'enfants en situation de handicap. Ces recherches ont été motivées d'une part par l'émergence d'un modèle conceptuel du handicap nouveau, proposé par l'OMS en 2001 (CIF), où le handicap est défini comme une restriction de participation, soulignant l'intérêt de mesurer précisément dans ces populations les facteurs susceptibles d'améliorer la participation ; et d'autre part par les avancées considérables dans le domaine médical qui en augmentant l'espérance de vie de ces enfants ont conduit à s'intéresser à d'autres indicateurs de santé comme la QdV. La part des facteurs environnementaux dans l'explication des variations de la QdV et de la participation reste cependant peu étudiée.

Dans la littérature, il est démontré que les attitudes négatives envers un pair handicapé constituent un facteur environnemental limitant sa pleine intégration, même dans le cas d'une scolarisation en milieu ordinaire (Rosenbaum P et al., 1988). Dans une étude menée par notre équipe dans la région Midi Pyrénées, l'étude CREATIVE, nous avions montré que les attitudes tendaient à être meilleures chez les filles mais ne différaient pas selon les autres caractéristiques personnelles ou familiales (âge, handicap personnel, résultats scolaires, redoublement, niveau socio-économique, structure familiale, taille de la fratrie). Elles tendaient également à être meilleures si la qualité de vie de la personne interrogée était bonne : en effet, plus les élèves se sentaient bien dans leur vie, plus ils étaient tolérants envers leurs pairs handicapés. Nous avions également montré que les attitudes envers un pair handicapé dépendaient fortement de l'expérience du handicap : les élèves ayant un ami handicapé et ceux ayant reçu des informations sur le handicap par les médias ou les parents adoptaient des attitudes plus positives, ce qui n'était

pas le cas quand la relation avec une personne en situation de handicap était moins rapprochée (autre membre de la famille, jeune dans la classe, l'ancienne école primaire, le collège ou les loisirs). Enfin, nous avions mesuré de moins bonnes attitudes chez les élèves lorsqu'il existait une Unité Pédagogique d'Intégration (UPI) dans le collège, accueillant des enfants présentant principalement un trouble cognitif dans l'échantillon observé (Vignes C et al., 2009). D'autre part, l'étude européenne SPARCLE (Colver A. , 2006) a permis notamment d'explorer l'influence de l'environnement sur la QdV d'une population représentative d'enfant de 8-12 ans paralysés cérébraux (Sentenac M et al. 2010). Selon les parents, la QdV de leur enfant dans le domaine de l'acceptation sociale (relation avec les pairs) diminuait avec l'augmentation de la sévérité de la déficience intellectuelle (Arnaud C et al., 2008). Mais la sévérité de la déficience physique et psychique n'était pas associée à la QdV dans ce domaine pour les enfants les moins sévèrement atteints qui avaient rapporté eux-mêmes la QdV (Dickinson HO et al., 2007). Par ailleurs, quelle que soit le domaine de QdV, les déficiences expliquaient jusqu'à 20% de la variation de QdV suggérant l'ampleur de l'influence d'autres déterminants, sociaux et environnementaux (Sentenac M et al. 2010).

Dans le cadre de ce projet, nous avons porté notre attention sur un élément de l'environnement important à l'adolescence, à savoir la place spécifique que tiennent les pairs. Les brimades (« bullying » en anglais) est un comportement fréquemment observé à cet âge, et est défini comme étant « des actions négatives physiques ou verbales répétées dans le temps, dont l'intention est de nuire, et qui implique une disproportion des forces entre l'agresseur et sa victime » (Olweus D, 1993) Les victimes de brimades sont caractérisées par une certaine vulnérabilité physique ou psychique (difficultés d'apprentissage, handicap physique, problèmes familiaux) (Leff S., 1999), ce qui les rend plus faibles face à leur agresseur. Les situations de fragilité semblent donc le point commun à ce type d'agression en milieu scolaire. Cependant, peu d'études s'intéressent spécifiquement aux brimades chez les enfants porteurs d'un handicap. Certaines études basées sur des entretiens semi-directifs d'enfants porteurs d'un handicap physique ou d'une maladie chronique soulignent le fait que ces enfants sont plus sujets aux brimades à cause de leur différence (Lightfoot J et al., 1999; Llewellyn A, 2000). D'autres études se sont focalisées sur des populations spécifiques. On peut noter quelques résultats chez des enfants présentant une paralysie cérébrale (Nadeau L and Tessier R, 2006; Yude C et al., 1998) qui confirment que ces enfants sont plus souvent mis à l'écart, ont moins d'amis et sont plus souvent victimes de violences. De plus, les résultats de l'étude SPARCLE sur le domaine de qualité de vie liée aux brimades que notre équipe a publiés montrent un niveau de QdV comparable des enfants paralysés cérébraux qui peuvent rapporter par eux même leur QdV comparativement à celle des autres enfants, issus de la population générale (Dickinson HO et al., 2007). Mais l'impact des brimades sur l'altération de la qualité de vie ou la restriction de participation n'a pas, à notre connaissance été étudiée chez les jeune présentant une maladie chronique ou un handicap.

Le travail réalisé dans le cadre de ce projet s'inscrit dans une approche globale visant à explorer l'influence de facteurs environnementaux, et notamment les composantes comportementales et attitudinales, sur la qualité de vie et la participation d'adolescents

en situation de handicap. Ces déterminants restent peu étudiés dans la littérature internationale, pourtant ils sont susceptibles d'amélioration. Ces recherches contribuent à identifier ces facteurs et préciser leur impact négatif sur la qualité de vie et la participation. On peut penser qu'à plus long terme, ces résultats permettront de mettre en place des études d'intervention visant à les améliorer et d'orienter les futures politiques de prévention à l'école.

LE PROJET DE RECHERCHE

1- Objectifs spécifiques

Des objectifs spécifiques ont été définis et explorés dans deux articles scientifiques soumis à des journaux internationaux avec comité de lecture. Ces objectifs sont décrits ci-dessous :

- Article N°1 : « Victims of bullying among students with a disability or chronic illness and their peers: a cross-national study between Ireland and France. »

Cette première recherche avait pour objectifs de (1) décrire la fréquence des victimes de brimades parmi les élèves présentant une maladie chronique ou un handicap en France et en Irlande, (2) de comparer les profils des victimes de brimades entre les élèves en situation de handicap et les autres, en termes de déterminants sociodémographiques, environnement social et familial, dans ces deux pays, et enfin (3) d'explorer le risque supplémentaire d'être brimé qu'ont les élèves en situation de handicap en fonction du degré de sévérité de leur condition. Nous avons voulu explorer ces questions en France et en Irlande car ces deux pays représentent deux environnements contrastés en termes de politique éducative et de prévention des brimades à l'école, et notre hypothèse était que ces différences contextuelles entre pays pouvaient influencer cette relation entre être porteur d'un handicap et être victimes de brimades.

Ce travail a été accepté pour publication par le « Journal of Adolescent Health » (première soumission) le 30 Juillet 2010. Cet article est actuellement consultable en ligne (cf. ci-après).

- Article N°2 : « Bullying-victimization at school and subjective health among students reporting disability or chronic illness: A cross-national study in 11 western countries. »

Dans cette deuxième étude, nous avons comparé la prévalence des victimes de brimades parmi les élèves présentant un handicap ou une maladie chronique à travers 10 pays Européens et le Canada. Dans un deuxième temps, nous avons comparé l'impact qu'un tel comportement pouvait avoir sur le bien-être des jeunes suivant qu'ils sont porteurs d'un handicap ou d'une maladie chronique, ou non. Notre hypothèse de recherche était que les jeunes porteurs d'un handicap ou d'une maladie chronique et qui sont victimes de brimades se perçoivent plus négativement en termes de santé et de bien-être que les autres victimes.

Ce deuxième papier constitue un travail collaboratif entre plusieurs équipes de différents pays

intéressées par cette problématique. Le manuscrit (cf. ci-après) est en phase de finalisation et sera soumis également au « Journal of Adolescent Health » début Décembre.

2- Population d'étude et mesures

Cette problématique a été explorée a partir des données 2005/2006 de **l'enquête Internationale de l'OMS HBSC (Health Behaviour of School aged Children)** réalisée tous les 4 ans auprès d'élèves scolarisés en milieu ordinaire et âgés de 11, 13 et 15 ans (Currie C et al., 2008). Les 41 pays qui ont participé à l'enquête en 2006 ont suivi le même protocole de recherche indiquant notamment l'ordre des questions, les consignes de traductions des questions, le protocole d'échantillonnage et la procédure de collecte des données. Les données ont été recueillies par auto-questionnaire administré en classe (Roberts C et al., 2009).

Cette enquête balaie un spectre très large de facteurs qui contribuent au « bien-être » des adolescents en lien avec leur environnement socio-démographiques, familial, et social. En plus de ces informations, des questions optionnelles étaient proposées, comme notamment de questions relatives au handicap et maladie chronique.

i) Mesure handicap/maladie chronique

Dans l'enquête 2006, 11 pays (Allemagne, Autriche, Bulgarie, Canada, Ecosse, France, Irlande, Lettonie, les Pays bas, Pologne et Portugal) ont pu choisi d'ajouter dans leur questionnaire trois questions permettant d'identifier les élèves présentant une maladie chronique ou un handicap.

Ces trois questions relatives au handicap et maladies chroniques sont les suivantes :

1- Est tu porteur d'une maladie chronique ou d'un handicap (comme diabète, allergie ou infirmité motrice cérébrale) ayant été diagnostiqués par un docteur ? (Oui/Non)

2- Prends-tu des médicaments dans le cadre de ta maladie chronique ou de ton handicap ? (Oui/Non)

3- Est-ce que ta maladie chronique ou ton handicap a des retentissements sur ta présence et ta participation à l'école ? (Oui/Non)

Un indicateur à trois niveaux a été construit à partir de deux des items précédents et interprété comme un indicateur de sévérité : (1) Pas de maladie chronique/handicap ; (2) Maladie chronique/handicap sans retentissement sur la présence et la participation à l'école ; et (3) Maladie chronique/handicap avec retentissement sur la présence et la participation à l'école.

ii) Mesure des brimades

Les brimades en milieu scolaire ont été appréhendées par deux questions ; l'une concernant celles subies par les élèves, l'autre celles auxquelles il aurait participé. Une courte explication du terme « brimade » était donnée en introduction : « *On dit qu'un(e) élève EST BRIME(E) lorsqu'un(e) autre élève ou un groupe d'élèves lui disent ou lui font des choses méchantes ou qui ne lui plaisent pas. On parle de brimade quand on se moque de manière répétée d'un(e) élève d'une façon qui ne plaît pas, ou quand on le (la) met*

délibérément de côté. Par contre, si deux élèves de la même force se disputent ou se battent, on ne peut pas dire que l'un d'eux (l'une d'elle) est brimé(e). De même, on ne parle pas de brimade quand on plaisante pour s'amuser et de manière amicale ». On notera que cette définition est la même dans tous les pays participant à l'enquête HBSC afin de limiter les effets d'une mauvaise compréhension du terme liés notamment aux variations culturelles. Les deux questions portaient sur une période de deux mois : « *Tous les combien as-tu été brimé(e) à l'école ces deux dernier mois ?* », « *Tous les combien as-tu participé à brimer un(e) ou des élèves ces deux derniers mois ?* » et offraient quatre possibilités de réponse : « *Je n'ai pas été brimé(e) à l'école ces deux derniers mois* » ou « *Je n'ai pas participé à brimer un(e) ou des élèves à l'école ces deux derniers mois* », puis, pour chaque question, « *Ce n'est arrivé qu'une ou deux fois* », « *Deux ou trois fois par mois* », « *Environ une fois par semaine* », « *Plusieurs fois par semaine* ».

iii) Mesure du bien-être des jeunes

Trois indicateurs complémentaires ont permis d'explorer le bien-être des jeunes :

1- La santé perçue : qui était mesurée par une question très simple : « *Dirais-tu que ta santé est* » avec quatre possibilités de réponse : « *excellente* », « *bonne* », « *assez bonne* » ou « *mauvaise* ». L'analyse des données a porté sur une moins bonne santé regroupant les catégories « « *assez bonne* » et « *mauvaise* », versus une bonne santé.

2- La perception globale de sa vie : mesurée à l'aide l'échelle de Cantril, échelle graduée de 10 à 0, la valeur 10 représentant « *la meilleure vie possible pour toi* » et la valeur 0 « *la pire vie possible pour toi* ». Il leur était demandé de répondre à la question « *Globalement, où dirais-tu que tu te trouves sur l'échelle en ce moment ?* ». Des scores inférieurs à 6 étaient considérés comme correspondant à des situations de « *mauvaise qualité de vie* ».

3- Les plaintes subjectives de santé ont été recueillies grâce à la *HBSC symptoms checklist*, mesure non-clinique de santé mentale développée par des chercheurs du réseau HBSC. Elle explore les symptômes somatiques et psychologiques les plus courants à l'adolescence, à travers deux questions : « *Durant les six derniers mois, as-tu eu : mal à la tête/ mal au ventre/ mal au dos/ des difficultés à t'endormir/ des étourdissements ?* » et « *Durant les six dernier mois, as-tu été : déprimé(e)/ irritable ou de mauvaise humeur/ nerveux(se) ?* ». Pour chaque symptôme, les réponses proposées étaient : « *A peu près chaque jour/ Plusieurs fois par semaine/ A peu près une fois par semaine/ A peu près une fois par mois/ Rarement ou jamais* ».

Plus de détails sur ces indicateurs sont disponibles dans Currie et Ravens (Currie C et al., 2008; Ravens-Sieberer U et al., 2009).

Le taux global de réponse obtenu dans chaque pays était supérieur à 70%.

RESULTATS

Article N°1 : « Victims of bullying among students with a disability or chronic illness and their peers: a cross-national study between Ireland and France. »

1- La version corrigée de cet article est en ligne depuis le 8 Octobre 2010 sur le site du « Journal of Adolescent Health » (cf. annexe 1). Ci-dessous le résumé en français des résultats :

Globalement, la prévalence des brimades subies était significativement plus élevée en France qu'en l'Irlande (respectivement, 34,2% [33,1 à 35,5] et 25,9% [24,5 à 27,4]). Les plus jeunes ont rapportés plus souvent être victimes de brimades ; toutefois, aucune différence n'a été observée entre les sexes. Dans les deux pays, les étudiants rapportant un handicap ou une maladie chronique ont déclaré plus souvent être victimes d'intimidation comparé aux autres étudiants, et un risque supplémentaire d'être victime d'intimidation a été constaté lorsque les élèves indiquaient que leur handicap ou une maladie chronique entrainait une restriction dans leur participation à l'école. Indépendamment du pays et de la présence ou non d'un handicap ou d'une maladie chronique, l'intimidation était significativement associée à un plus faible soutien social et une plus grande difficulté à communiquer avec leur père, et avec des associations encore plus forte trouvées parmi les étudiants déclarant avoir un handicap ou une maladie chronique.

2- Par ailleurs, cet article a fait l'objet d'un article écrit par une journaliste indépendante et publié sur un site internet américain (*Health Behavior News Service* ; http://www.cfah.org/hbns/) qui vise à diffuser l'information scientifique à plus grande échelle. Cela montre l'intérêt particulier porté à ce travail et à cette problématique. Cet article est en ligne depuis le 7 Octobre 2010 (http://www.cfah.org/hbns/archives/getDocument.cfm?documentID=22312).

Ci-dessous, l'article en intégralité :

Kids With Chronic Illness, Disability More Apt to Be Bullied

By Glenda Fauntleroy, Contributing Writer
Health Behavior News Service

On top of all the other hardships they face daily, adolescent students living with a disability or chronic illness are more likely to be victims of bullying from their peers at school, a new French and Irish study finds.

"We were not overly surprised to learn that children with disability are more vulnerable to bullying, because of a lower self-esteem, sometimes differences in appearance or because they have special needs," said lead author Mariane Sentenac, of the University Paul Sabatier in Toulouse, France.

Sentenac and her colleagues used data from the Irish and French 2006 Health Behavior in School-aged Children World Health Organization collaborative study. In all, 12,048 students ages 11, 13 and 15 participated. The findings appear online in the *Journal of Adolescent Health.*

Students responded to items on how frequently they had experienced bullying at school in the past couple of months. They also answered questions on whether they had a disability or chronic illness such as cerebral palsy, diabetes, arthritis or allergy. Twenty percent of the students in Ireland and 16.6 percent in France reported having one of these conditions.

The study showed that students who reported having a disability or chronic illness — no matter where they lived — were more likely to be experience bullying from peers than those who did not. For instance, in France, 41 percent of boys with a disability or chronic illness reported undergoing bullying compared with 32 percent of boys without. Gender, however, was not a factor — boys and girls were victims equally often.

In addition, when students with a disability or chronic illness were restricted from participating in school activities, they had a 30 percent additional risk of being bullied.

Mark Schuster, M.D., professor of pediatrics at Children's Hospital Boston and Harvard Medical School, said that bullying of children with disabilities is a definite problem in the United States as well.

"Unfortunately, children who stand out in any way, because of their health, their race, their orientation, or anything else that distinguishes them from most kids in a school, can find themselves a target of bullying," Schuster said.

The study suggested better family communication and anti-bullying prevention programs could help reverse this trend.

"In my view, good relations with teachers and parents could play an important role in preventing and detecting bullying behaviors between students because they are in a position to observe two different aspects of the adolescent's life," Sentenac said.

# # #

FOR MORE INFORMATION:
Reach the Health Behavior News Service, part of the Center for Advancing Health, at (202) 387-2829 or hbns-editor@cfah.org

Journal of Adolescent Health: Contact Tor Berg at (415) 502-1373 or tor.berg@ucsf.edu or visit www.jahonline.org

Sentenac M, et al. Victims of bullying among students with a disability or chronic illness and their peers: a cross-national study between Ireland and France. *J Adol Health* online, 2010.

Article N°2 : « Bullying-victimization at school and subjective health among students reporting disability or chronic illness: A cross-national study in 11 western countries. »

Le manuscrit de cet article est en voie de finalisation et sera soumis au « Journal of Adolescent Health » au plus tard début Décembre. Les nombreuses collaborations associées à cet article a permis de réaliser un travail interdisciplinaire, mais a retardé légèrement la soumission de ce papier par rapport à notre calendrier initial.

Le manuscrit de l'article, **strictement confidentiel jusqu'à sa publication**, est reporté en annexe (cf. annexe 2).

Diffusion des résultats

i) Au niveau international

Les résultats de ce travail ont été présentés sous la forme de deux posters au « 20th IUHPE World Conference On Health Promotion » qui s'est déroulé à Genève les 11-15 Juillet 2010 (cf. annexes 3 et 4).

1- Sentenac M, Gavin A, Nic Gabhainn S, Molcho M, Arnaud C, Godeau E. Bullying behaviours among children with a disability or chronic illness and the peers: A cross-national study between Ireland and France.

2- Sentenac M, Gavin A, Nic Gabhainn S, Molcho M, Arnaud C, Godeau E. Bullying a school among disabled students and impact on self perceived health: A multilevel study across 11 western countries

Ce travail sera proposé pour une communication orale au prochain Congrès mondial d'épidémiologie qui se tiendra à Edimbourg en Aout 2011 (http://www.epidemiology2011.com/), et dont une des thématiques abordées est autour du handicap et des maladies chroniques.

ii) Au niveau national

Ce travail a été présenté au cours de la dernière réunion annuelle du groupe de travail « Enfant » de l'IFR-Handicap (IFR 25, JF Ravaud) le 11 Mars 2010 à Paris.

Et enfin, nous envisageons également de proposer une communication orale aux « Journées de Psychologie et Psychopathologie de l'enfant & de l'adolescent » qui se tiendront à Lyon les 3-5 Novembre 2011. Le lien du site internet :

http://www.afpssu.com/ressources/colloque_psychopathologie_et_handicap_presentation.pdf

PERSPECTIVES

Le projet de postdoctorat de Mariane Sentenac est en cours de finalisation et aura pour objectif de s'intéresser aux comportements à risque chez les jeunes en situation de handicap. Ce nouveau projet s'inscrit dans une même perspective qui vise à mieux comprendre l'environnement de ces jeunes, à travers les comportements risques fréquents à l'adolescence, et des éléments susceptibles d'améliorer leur qualité de vie.

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ANNEXES

1- Article N°1

Sentenac M, et al. Victims of bullying among students with a disability or chronic illness and their peers: a cross-national study between Ireland and France. J Adol Health online, 2010.

2- Manuscrit de l'article N°2

" Bullying-victimization at school and subjective health among students reporting disability or chronic illness: A cross-national study in 11 western countries."

3- Poster N°1

Sentenac M, Gavin A, Nic Gabhainn S, Molcho M, Arnaud C, Godeau E. Bullying behaviours among children with a disability or chronic illness and the peers: A cross-national study between Ireland and France. 20th IUHPE World Conference on Health Promotion. Geneva, Switzerland, 11-15 July 2010.

4- Poster N°2

Sentenac M, Gavin A, Nic Gabhainn S, Molcho M, Arnaud C, Godeau E. Bullying a school among disabled students and impact on self perceived health: A multilevel study across 11 western countries. 20th IUHPE World Conference on Health Promotion. Geneva, Switzerland, 11-15 July 2010.

Journal of Adolescent Health xx (2010) xxx

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Victims of Bullying Among Students With a Disability or Chronic Illness and Their Peers: A Cross-National Study Between Ireland and France

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Keywords: Students, Bullying, Disability, Chronic illness, School participation, Social network, Family

A B S T R A C T

Purpose: To explore bullying victimization among French and Irish students with a disability or chronic illness (D/CI), considering individual, social, and family factors. We investigated this issue in France and Ireland because of the documented differences between these two countries on relevant contextual factors.
Methods: Data from 12,048 students aged 11, 13, and 15 years (50.1% were boys) as part of the cross-national study 2006 Health Behaviour in School-aged Children were analyzed. Self-completion questionnaires were administered in classrooms; information on socio-demographic characteristics, bullying involvement, D/CI, school participation, social network, and family were collected. Multivariate logistic regressions were performed with individual, social, and family cofactors.
Results: Overall, the prevalence of bullying victimization was significantly higher in France compared with Ireland (34.2% [33.1–35.5] and 25.9% [24.5–27.4, respectively]). Youngest were more likely to report victimization; however, no gender differences were observed. In both countries, students with D/CI were significantly more likely to report that they have been bullied compared with students without D/CI, and a significant additional risk of being bullied was found when students reported D/CI with restriction in school participation. Regardless of country and D/CI status, being bullied was significantly associated with weaker social support and difficulty of communication with fathers, with even stronger associations found among students with D/CI.
Conclusion: Adolescents with D/CI are more likely to be victimized than their peers, with a similar risk in both countries. Besides individual, social and family factors are consistently associated to bullying victimization across countries. These results will guide future antibullying prevention programs.

Bullying is a common problem among children and adolescents and its description, prediction, and prevention have motivated many researchers and educators [1,2]. Prevalence studies have consistently reported that a significant number of school-aged children are involved in bullying, even if its prevalence varies across countries [3–5]. A recent international study reported significant decreases in bullying behaviors over the past decade in most countries studied, showing a positive development in the context of existing prevention activities [6].

The Olweus definition of bullying has been widely used in the published data. Olweus defined bullying as negative physical or verbal actions that have hostile intent, cause distress to victims, are repeated, and involve a power differential between bullies and victims. Thus, three important elements that define bullying are repetition, harm, and unequal power [7].

Recent studies have focused on understanding the conditions surrounding bullying, highlighting the need to consider contex-

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tual models to examine positive and negative adolescent behaviors [8–11]. Although some socio-demographic, family, and social factors have been found to be consistently associated with victimization, few studies have taken them into account together, or explicitly examined their interactions [3,10,12]. Previous studies have reported that men [1,5,13], younger children [1,3,5,10], those living in a nonintact family [5,13,14], with parents with low socioeconomic [13] or educational levels [3,5], who experience difficulties in communicating with their parents [14], poorer relationship with parents [10,13] or classmates [1,14], poorer social support [3], social isolation [14], fewer friends [10], poorer school climate [13], lower school involvement and performance [14] are more victimized.

Knowledge of bullying among students with a disability or chronic illness (D/CI) is sparse. Although some studies have documented higher rates of bully victimization among adolescents with D/CI [5,13,15,16], they tend to focus on specific conditions and show that specific groups of children (children with learning disabilities [17], attention-deficit and/or hyperactivity disorder [12], or cerebral palsy [18]) are at greater risk of being victimized. The hypothesis that adolescents different in appearance or in behavior are more likely to be bullied has also been investigated [13,19,20]. However, studies exploring bullying among adolescents with D/CI with a multicontextual explanatory approach are rare [13]. In her review, Stassen Berger [2] argues that there is not only one cause of bullying, but rather that the interaction between the chronic condition and the environment of the adolescent best predicts bullying. A previous study found that children with visible disability were overall more likely to be bullied; however, this association was not significant when elements of the child's environment were included in the analysis [19]. The negative effect of D/CI on children's participation in recreational and sporting activities has been documented, highlighting a higher risk of social isolation [21], whereas others have described bullying as an environmental barrier to full social participation for children with or without disability [22,23].

The aims of this article are (1) to describe the frequency of bullying victimization in students according to their D/CI status in Ireland and France; (2) to compare the relative strength of the associations between socio-demographic, social network, family factors, and bullying victimization between students with or without D/CI across these countries, hypothesizing that the environment at several levels may influence student's behaviors differently for students with D/CI compared with others; and (3) to document the additional risk of bullying victimization associated with the level of D/CI. We investigated this issue in Ireland and France as two contrasting environments which may influence bullying among students with D/CI: first, there is a large cross-national variation in the frequency of bullying behaviors, Ireland ranking lower than France [4]; and second, policies advocating inclusive education of students with disability into mainstream schools are more recent in France compared with Ireland.

Methods

Sample

This study uses data from the Irish and French 2006 Health Behavior in School-aged Children (HBSC) World Health Organization cross-national collaborative study. Research teams in participating countries followed the same protocol [24] regarding question ordering, translation guidelines, comprehensive guidance on sampling and data collection procedures, so as to facilitate subsequent cross-national analyses. The population studied consists of nationally representative samples of students (random design, geographic and/or school grades stratification, and clustering into schools and classrooms), in three age groups (mean aged: 11.5, 13.5, and 15.5) broadly covering the onset and the middle years of adolescence, when changes occur and decisions are beginning to be made. Participation was anonymous and voluntary; consent was obtained from parents and students. Each country obtained approval to conduct the survey from the relevant institutional review board or equivalent regulatory institution. The response rates at school and student levels were 63% and 83% in Ireland, and 79% and 81% in France, respectively.

Measurement

Data were collected using standardized self-completion questionnaires administered in class. The questionnaire was developed by an interdisciplinary research group from the participating countries and a translation and/or back translation procedure was used to guarantee language equivalence.

Questions about bullying were those developed by Olweus [7] and were preceded by a standardized definition to ensure similar comprehension across countries. Participants were asked to report how frequently they had been bullied at school in the past couple of months. The five response options ranged from "I have not been bullied in the past couple of months" to "several times a week." For analyses, responses were dichotomized into "never" versus "at least once in the past couple of months."

To identify children with D/CI, a yes or no question, adapted from Finnish and Canadian 2001/2002 HBSC surveys, was used [25]: "Do you have a long-term illness, disability, or medical condition (like diabetes, arthritis, allergy, or cerebral palsy) that has been diagnosed by a doctor?" A subsequent question allowed identification of children for whom their D/CI restricted attendance or participation at school [25]. Students were then classified into three mutually exclusive categories as non D/CI children, D/CI without restriction in participation, and D/CI with restriction in participation.

The association of three independent groups of factors (sociodemographic, social network, and family factors) with bullying victimization was investigated. Sociodemographic factors included age, gender, and family affluence, the latter assessed by the validated Family Affluence Scale [26] through a composite score used as an ordinal indicator of affluence: high, middle, and low. The quality of social network was investigated by two indicators: one on communication with same-gender friends and a three-item scale measuring social support from classmates developed for the study (with a global score of classmate support ranging from 0 to 12, dichotomized into strong [12–6] vs. weak [6–0] support). Family factors were represented by family structure (living with both biological parents or not), and communication with mother and father was considered separately. The same item was used to measure ease of communication with mother, father, and same-gender friend ("How easy is it for you to talk to the following persons about things that really bother you?") coded on a five-point Likert scale. Ease of communication variables were dichotomized into "very easy/easy" and "difficult/very difficult," while the response "Don't have or see this person" was recoded in missing. More information related to these items is available in Currie et al [4].

Statistical analyses

All analyses were performed separately for each country; all estimates were adjusted according to the structure of the sampling frame. Univariate analyses were performed to describe the distribution of the three relevant groups of independent variables (sociodemographic, social network, and family factors), and Pearson's chi-square tests were used to explore differences across the countries. Frequencies of being bullied were compared by age, gender, and D/CI status using Pearson's chi-square statistics. No significant difference was found regarding missing data on bullying victimization according to disability level (1.4% missing data in No D/CI, 1.0% D/CI without restriction, and 1.9% D/CI with restriction).

To explore and compare the strength of the associations between bullying victimization and sociodemographic, social network, family factors between students with or without D/CI across countries, separate logistic regression models were performed for students reporting a D/CI and for others in each country. The interaction terms were tested between country and all cofactors to explore cross-country differences. To estimate the additional risk of being bullied associated with reported D/CI, with or without restriction in school participation, an additional logistic regression analysis was performed, adjusted for all cofactors and country. This "level of disability" variable in three categories was considered a proxy for the severity of the disability, and this interpretation was supported by preliminary analyses that revealed a linear relation with the risk of being bullied. Level of disability was tested as a dichotomous variable as well as an ordinal variable, which increases the power of the estimation.

Odds ratios (ORs) for reporting being bullied at least once in the past couple of months were calculated. Confidence Intervals were computed at the 95% level and statistical significance was established at $p < .05$. All analyses were performed using STATA 9.2 (Statacorp LP, College Station, TX) [27].

Table 1
Comparison of socio-demographic, social network and family characteristics by country

	Ireland (n = 4,894) n (%)	France (n = 7,154) n (%)	*p*-value
Socio-demographic factors			
Gender			
Girls	2,417 (49.4)	3,596 (50.3)	ns
Boys	2,477 (50.6)	3,558 (49.7)	
Age			
15 years old	1,685 (34.8)	2,222 (31.1)	<.05
13 years old	1,785 (36.9)	2,425 (34.0)	
11 years old	1,370 (28.3)	2,493 (34.9)	
Family affluence			
High	932 (20.4)	3,432 (49.6)	<.001
Medium	2,559 (56.2)	2,642 (38.1)	
Low	1,065 (23.4)	849 (12.3)	
Disability/chronic illness			
No D/CI	3,848 (81.5)	5,930 (83.8)	<.001
D/CI without restriction	615 (13.0)	931 (13.1)	
D/CI with restriction	260 (5.5)	220 (3.1)	
Social network factors			
Communication with same sex friends			
Easy or very easy	3,657 (82.5)	4,909 (77.9)	<.001
Not easy	707 (17.5)	1,391 (22.1)	
Weak classmate support			
No	4,375 (91.2)	6,119 (87.9)	<.001
Yes	423 (8.8)	845 (12.1)	
Family factors			
Family structure			
Two parents	3,727 (80.6)	5,164 (73.4)	<.001
Others	899 (19.4)	1,875 (26.6)	
Communication with mother			
Easy or very easy	3,732 (82.3)	4,983 (74.1)	<.001
Not easy	805 (17.7)	1,741 (25.9)	
Communication with father			
Easy or very easy	2,952 (67.3)	3,404 (53.1)	<.001
Not easy	1,432 (32.7)	3,004 (46.9)	

Results

The sample consisted of 4,894 students in Ireland and 7,154 students in France. Table 1 shows the characteristics of the samples by country. The percentage of students reporting D/CI was higher in Ireland (20.6%) than in France (16.6%) ($p < .001$). As compared with the Irish students, French students were significantly more likely to report negative social network (in terms of communication with same-gender friends and classmate support) and more difficulties in communication with their parents. They were also less likely to live with their two parents.

A very consistent pattern emerged, with bullying behaviors more often reported in France than in Ireland in all age (results not shown), gender, and D/CI status groups (Table 2). Overall, 34.2% (33.1–35.5) of students reported being bullied in France versus 25.9% (24.5–27.4) in Ireland ($p < .001$). In both countries, and regardless of the D/CI status, the youngest students were significantly more likely to report being bullied than older students; and there were no significant gender differences in being bullied. Students with D/CI were significantly more likely to report being bullied in both countries (except among Irish boys).

Table 3 presents the associations between bullying victimization and the three independent groups of factors: sociodemographic, social network, and family factors, by D/CI status and by country. Regardless of country and D/CI status, weak classmate support was significantly associated with being bullied, and this association tended to be stronger for students reporting D/CI. A particularly strong association (odds ratio (95% confidence interval)) was found between being bullied and students reporting D/CI both in Ireland: OR 3.5 (2.0–6.1) and in France: OR 4.0 (2.6–6.1). Ease of communication with same-gender friends was found to be significantly positively associated with bullying victimization only among students without D/CI. Regarding family factors, ease in communication with father was consistently, inversely, and significantly associated with being bullied in both countries. Ease in communication with mother was not found to be significantly associated with bullying victimization, except in Ireland for students without D/CI: OR 1.4 (1.1–1.7).

Table 4 shows the associations between being bullied and the level of D/CI adjusted for all other factors. In both countries, students who reported D/CI with restricted participation at school had a significantly higher risk of being bullied (fully adjusted model: OR 1.8 [1.4–2.4]), compared with those with D/CI without restriction (OR: 1.3; 1.1–1.4). The interaction between communication with mother and country was statistically significant ($p = .006$), indicating that among students who reported communicating more easily with their mother, French students were significantly more victims of bullying than Irish students (OR: 1.4; 1.2–1.6). No cross-country difference was found among students reporting difficulty in communication with mother.

Table 2
Comparison of students (% and 95% Confident Interval) reporting bullying victimization by disability/chronic illness (D/CI) status, gender and country

	Total		D/CI		No D/CI		*p*-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Ireland							
Boys	642	26.7 (24.8–28.6)	146	29.4 (25.5–33.5)	494	26.1 (24.0–28.3)	ns
Girls	601	25.2 (23.2–27.4)	154	32.1 (27.9–36.6)	446	23.6 (21.4–26.0)	<.001
France							
Boys	1,164	33.3 (31.8–35.0)	245	41.0 (37.2–45.0)	915	31.8 (30.1–33.5)	<.001
Girls	1,253	35.1 (33.5–36.7)	236	41.0 (37.0–45.2)	1,009	33.9 (32.2–35.7)	<.01

Discussion

Our findings confirm cross-national differences in bullying victimization with a higher prevalence in France than in Ireland [4], even after controlling for a range of factors previously found to be associated with bullying behaviors. In both countries, students with D/CI were significantly more likely to report that they had been bullied than students without D/CI, and a 30% additional risk of being bullied was found when students reported both D/CI and restriction in school participation. Being bullied was consistently associated with weaker social support and difficulty of communication with fathers, with even stronger associations among students with D/CI.

Two factors might help explain the cross-national variation between countries: differences in the interpretation of the bullying concept and cultural or contextual differences. Stassen Berger [2] suggests that variation in the interpretation of the term bullying and the understanding of the concept could help to explain some variation across countries reported in the published data on bullying. However, the preamble in our questionnaire describes bullying in a complete and clear manner, and thus provides a common operational definition, allowing confidence in these cross-national comparisons. The variations observed in bullying rates may well stem from different educational systems or different national or school level policies related to bullying prevention. School bullying is well known in Scandinavian and Anglo-Saxon countries, where many prevention programs have been implemented, since many years. In Ireland, all schools have been required to take action against bullying and have a locally agreed and implemented antibullying policy. In contrast, the term "school violence" appeared in France only 10 years ago, without an emphasis on bullying or being specific about "power differentials" inherent in bullying behavior. In addition, antihazing legislation exists in France since 1997, but prevention programs are aimed at graduate students. Molcho et al have shown that in many countries where national prevention is consistent, the prevalence of bullying behaviors has recently decreased [6], and this has been the case in Ireland. A decrease was also observed in France, which may be attributed to the observed growing media coverage of school violence in general.

Table 3
Associations between bully victimization and predictors by disability/chronic illness (D/CI) status and country

Country	Ireland		France	
Disability/chronic illness status	D/CI (n = 686)	No D/CI (n = 2,820)	D/CI (n = 893)	No D/CI (n = 4,439)
Indicator	OR[a] (95% CI)	OR[a] (95% CI)	OR[a] (95% CI)	OR[a] (95% CI)
Socio-demographic factors				
Gender				
Girls	1.0	1.0	1.0	1.0
Boys	1.0 (.7–1.3)	1.3 (1.1–1.6)	1.2 (.9–1.6)	1.1 (1.0–1.2)
Age				
15 years old	1.0	1.0	1.0	1.0
13 years old	1.4 (.9–2.2)	1.5 (1.2–1.8)	1.6 (1.1–2.3)	1.7 (1.4–2.0)
11 years old	1.4 (.9–2.2)	1.8 (1.4–2.3)	1.8 (1.2–2.5)	1.9 (1.6–2.2)
Social network factors				
Communication with same sex friends				
Easy or very easy	1.0	1.0	1.0	1.0
Not easy	1.5 (1.0–2.3)	1.3 (1.0–1.6)	1.2 (.9–1.7)	1.2 (1.1–1.4)
Weak classmate support				
No	1.0	1.0	1.0	1.0
Yes	3.5 (2.0–6.1)	2.8 (2.1–3.8)	4.0 (2.6–6.1)	3.4 (2.8–4.1)
Family factors				
Family structure				
Two parents	1.0	1.0	1.0	1.0
Others	1.2 (.7–1.9)	1.4 (1.1–1.8)	1.6 (1.2–2.3)	1.1 (1.0–1.3)
Communication with mother				
Easy or very easy	1.0	1.0	1.0	1.0
Not easy	1.1 (.7–1.8)	1.4 (1.1–1.7)	.8 (.5–1.1)	1.0 (.9–1.2)
Communication with father				
Easy or very easy	1.0	1.0	1.0	1.0
Not easy	2.1 (1.4–3.2)	1.5 (1.2–1.9)	1.9 (1.4–2.5)	1.6 (1.4–1.8)

[a] Adjusted for FAS (Family Affluence Scale).

Table 4
Associations between bullying victimization and level of disability or chronic illness (D/CI)

Level of disability	n	OR[a] (95% CI)	*p*-value
No D/CI	7,259	1	
D/CI without restriction[b]	1,178	1.3 (1.1–1.4)	<.01
D/CI with restriction[b]	314	1.8 (1.4–2.4)	<.001
Ordinal assumption[c]	8,751	1.3 (1.2–1.4)	<.001

[a] Adjusted for age, gender, FAS, communication with same sex friends, classmates support, family structure, communication with mother, communication with father and country.
[b] Level of disability/chronic illness entered as a dichotomous variable with no D/CI as reference group.
[c] Level of disability/chronic illness entered as ordinal. Odd ratio thus indicate in risk for each level.

Despite the differences in bullying rates between both countries, we found that students with D/CI are more likely to be victimized with a similar risk in Ireland and in France. In many Western countries, children with D/CI have become increasingly integrated into mainstream schools assuming that inclusive education encourages the acceptance of children with disability by their peers. In both France and Ireland, education systems favor mainstreaming and offer a variety of special needs services, but the concept of truly inclusive education is relatively new in both education systems [28]. In France, the legislative framework on disability was recently reformed with the Act for Equal Right and Opportunities, Participation and Citizenship of Disabled People of February 11, 2005 recognizing the right for any child with disability to attend his and/or her local primary or secondary school. In Ireland, the Education Act 1998 requires the provision of a quality education to each person in the country, whereas the 2004 Education for Persons with Special Needs Act specifies that education must be inclusive, unless there are particular reasons why a specialized placement is required for an individual child.

Our study explored factors associated with bullying victimization among adolescents with and without D/CI, using a global approach taking into account individual, social network, and family factors, in two countries with contrasting contexts. We found considerable similarities between countries and between D/CI status groups in the factors associated with being bullied. Consistent with previous studies, we found that younger students were more likely than older students to report that they have been bullied [1,3,5,29,30], and this holds true for D/CI students as well. Social networks, in terms of social skills [31], number and quality of friends [2], and friendship quality [32], have been described as a moderator of risk factors in predicting peer victimization. More specifically, some studies have shown that some chronic conditions, causing lower youth involvement in social activities and depleting their social network, place students at higher risk of being bullied [33]. Students with D/CI may be more frequently absent from school if they are receiving treatment or special lessons, and this can affect their social standing and friendships [33]. With a stronger influence of classmate support on victimization among adolescents with D/CI, our findings are consistent with this literature. Our results in relation to family factors are more surprising, and somewhat controversial, with the strong association between ease in communication with fathers and bullying victimization, and a less consistent association for communication with mothers. To our knowledge, the specific role of fathers in relation with bullying victimization has not been explored, but rather the familial environment through either both parents or mothers only [5,13,15,34]. Some studies have shown that fathers have a unique contribution to their children's behaviors, irrespective of the mothers role [35], and relationships with fathers have been shown to be of particular importance when the father is not residing in the main family home [36].

In addition and in accordance with the published data on bullying that have shown that victims of bullying are also often bullies [1,10,14,16], we performed a sensibility analysis to check whether the students reporting D/CI were more victims than bully-victims and had a different profile in terms of social and family context. No differences were found on analysis.

We also studied the additional risk of being bullied associated with the level of disability adjusted for all cofactors. Our results confirm the hypothesis that the level of disability was more severe when students reported that their D/CI affected their school participation compared with those reporting D/CI without such a restriction in participation. However, additional quantitative and qualitative studies are required to help document the nature of the relationships between all these dimensions.

The current article is based on large representative samples in two countries, using standardized research methods that had been tested many times in previous HBSC studies, language equivalence, and a common operational definition of bullying. France and Ireland were chosen for analysis primarily because of the differences in reported prevalence of school bullying behaviors as known in previous waves of the HBSC studies [4]. It should be noted that the samples also differ on other indicators: higher rates of D/CI students and lower levels of family affluence in Ireland and more children not living with both parents in France. Another strength of this study is its relevance to public health and its potential contribution to prevention efforts toward a vulnerable population.

However, this study relies on self-reported data for both bullying behavior and D/CI status. Self-reported D/CI is significantly more prevalent in Ireland than in France. This could stem from higher level of integration of children with D/CI in mainstream education in Ireland or from a different understanding of the question, despite the examples given. On the basis of other sources, prevalence data on chronic conditions among adolescents in France and Ireland are not available for comparison. However, previous Canadian results suggest that chronic conditions can be under-reported by children compared with parents [25,37]. In line with some previous findings indicating that allergy and asthma are the most commonly reported chronic conditions in childhood [16,37,38], we assumed that in our sample, most students reporting D/CI without restriction have such illnesses, and that a higher proportion of students with most severe chronic illness and disability are to be found among those reporting D/CI with restricted participation at school. In our data, difference across countries of prevalence were significant for students reporting D/CI with restricted participation (France: 3.1% [2.7–3.5] vs. Ireland: 5.5% [4.9–6.2]) but not for those reporting D/CI without restriction (France: 15.2% [12.4–14.0] vs. Ireland: 13.0% [12.1–14.0]). This could mirror the fact that the integration of students with more severe disability is more advanced in Ireland. Qualitative work would help in further understanding these differences. Another limitation of the present study is related to the general measure of bullying that was used: we cannot distinguish between different forms or types of bullying, such as physical or social exclusion bullying. Qualitative studies on students' percep-

tions of bullying could be particularly useful in helping to understand any existing cross-national differences in bullying.

Nansel et al [1] highlighted that young people who are bullied generally have higher levels of insecurity, anxiety, depression, loneliness, unhappiness, physical and mental symptoms, and lower self-esteem. Another study has shown that students who have been bullied are more likely to have more fragile health at adulthood [39]. Future prevention and intervention programs should pay more attention to students with D/CI whose number is increasing in schools and who are especially vulnerable to bullying. Consequences for these young people are multiple including more social isolation, less participation in activities at school, more negative self-perceptions, as well as potential effects on both objective and subjective components of health. We have shown that contextual factors were associated with reports of bullying victimization, and these should be considered for future strategies to prevent such bullying at school and in other settings. Vignes et al [40] found that factors related to disability knowledge were significantly associated to better attitudes among students. Thus, we also recommend the inclusion of a disability component in future antibullying programs and policies, and to take into account students' environment, that is peers, teachers, and family members.

In conclusion, our study highlights the need to pay attention to the particular issues for children with D/CI associated with bullying victimization, and these findings deserve qualitative exploration cross-nationally. This study also suggests that there is a need to further investigate the possible health consequences of being bullied among students with D/CI because they seem to cumulate vulnerabilities associated with being bullied, as well as or in combination with their existing chronic conditions.

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TITLE

Bullying-victimization at school and subjective health among students reporting disability or chronic illness: A cross-national study in 11 western countries.

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BACKGROUND

Adolescence is a period of physical, psychosocial, and social developmental changes, which is likely to represent a particular challenge to adolescents with chronic conditions or disability, as their condition can be considered as an additional burden to face compared to their peers [1].

Bullying is a relatively common experience among schoolchildren in countries throughout the world [2, 3]. School bullying refers to negative actions inflicted, repeatedly and over time, by one or more other persons, to a defenseless victim [4]. Three elements are important characteristics of bullying: repetition - that the acting occurs repeatedly; intended harm - that the action is internationally harmful; and unequal power - that the victim is considered to have lower status of power compared to the perpetrator(s). These factors are used to distinguish bullying from other forms of school violence.

According to Olweus [4], bullying is an act of gaining power over others. Hence, less powerful children may find themselves easy victims. Previous studies have reported higher prevalence of bullying-victimization among children or adolescents with specific conditions such as learning disability [5], cerebral palsy [6] or language impairment [7]. These studies focused on visible and/or stigmatizing conditions. Other studies also reported a higher risk of bullying-victimization for children with chronic condition with no precision on the type of condition [8-11]. Data from France and Ireland reported a 30% higher risk of being bullied among school children who reported a disability or chronic illness compared to others [10].

Consequences of bullying-victimization have been widely explored. Children or adolescents who are victims of bullying experience a range of problems including anxiety, poor self-esteem, depression, and in extreme cases, suicide [12]. Other studies have found that bullying-victimization was associated with frequent somatic complaints [13, 14]. These findings were confirmed by Gini [15] in a meta-analysis of 11 studies. Gini reported a pooled odds ratio of 2.00 (95%CI: 1.70-2.35) among victimized children in reporting psychosomatic complaints. Other study has shown being bullied associated with poorer health perception [16]. Longitudinal studies have shown that victimization in childhood may lead to health problems in adolescence [17-19], which may track into adulthood [20].

While the association of bullying-victimization with poor health is well established, it needs to be acknowledged that some of the indicators reported in the literature (somatic headaches, for example) may also be linked to social, school and family problems [12]. Life satisfaction

is often used to assess overall perception of life and is considered as an important aspect of well-being [21]. Such global health perception can be used to assess adolescent's health as a synthetic measure integrating different health components. Additionally, some studies described a significant association between psychosocial health indicators, such as symptom complaints and life satisfaction, and perception of health [22]. Having a disability or chronic illness has been described as a determinant of health perception [23], as well as a range of factors related to social, family and school environment (e.g. school pressure or communication with parents) [22, 23]. Indeed, Van Cleave [11] suggested that bullying-victimization might worsen some chronic condition inducing more health problems, but to our knowledge, no study explicitly focused on consequences of bullying-victimization for subjective health among children with chronic condition.

Therefore, the objectives of this study are: 1) to compare prevalence of school bullying-victimization among students with a disability or chronic condition with bullying prevalence among a general sample of students across countries; and 2) to compare the strength of the association between bullying-victimization and perceived health among students reporting disability or chronic illness and others. We hypothesize that bullying-victimization shows a stronger association with health perception among students reporting a disability or chronic illness compared to students who do not report such a condition. Based on the literature suggesting that victims of bullying are also often bullies themselves [11, 24, 25], and that students who are both victims and perpetrator (bully-victims) have a greater risk for psychosomatic problems than victims [24], we analyzed victims and bully-victims separately and compared these groups to those not involved in any bullying behavior.

METHODS

Sample

This research is based on the data from the 2005/2006 WHO collaborative cross-national study Health Behaviour in School-aged Children (HBSC) [26]. Research teams in participating countries followed the same research protocol which included question ordering, translation guidelines, comprehensive guidance on sampling and data collection procedures, in order to facilitate subsequent cross-national analyses [27]. Schools or classes were randomly sampled in each participating country (cluster sampling design) to obtain a minimum sample size for each country of 1536 students per age group (mean age desired was

11.5, 13.5 and 15.5) in order to assure a 95 % confidence interval of ±3 % for prevalence estimates. Participation was anonymous and voluntary, and the study adhered to all national ethical guidelines for each country involved. Data from 11 countries (Austria, Bulgaria, Canada, France, Germany, Ireland, Latvia, Netherlands, Poland, Portugal and Wales) were eligible for the present analysis. School/class and student level response rates exceeding 70% were obtained in the majority of countries [27].

Measurement

Data were collected using standardized self-completion questionnaires administered in the classroom. The questionnaire was developed by an interdisciplinary research group from the participating countries and a translation/back translation procedure was used to guarantee language equivalence.

Three complementary outcomes were used to assess subjective health: general health perception, overall life-satisfaction and subjective health complaints [21]. General health was assessed by asking respondents "Would you say your health is…?" with four answer options (excellent, good, fair or poor). For this analysis, students reporting a « poor » or a « fair » global health were compared to others. Students were asked to rate their life satisfaction at present using a validated ladder, with the bottom of the ladder (0) representing the worst possible life and the top of the ladder (10) representing the best possible life [28]. Respondents with scores between 0 and 6 were classified as declaring a low life satisfaction. Third, students were asked to report the frequency with which they experienced each following psychosomatic symptoms during the last 6 month (headache, stomach-ache, back ache, feeling low, irritability, feeling nervous, difficulties in getting to sleep, and feeling dizzy), with five different answer options (about every day, more than once a week, about every week, about every month, rarely or never). For this analysis, we considered that students experienced multiple health symptoms, when they reported two or more symptoms more than once a week [21]. More details about these indicators are available in Ravens-Sieberer [21].

The two questions and the definition of bullying used in the survey were those developed by Olweus [4] ("How often have you been bullied at school in the past couple of months?" and "How often have you taken part in bullying another student(s) at school in the past couple of months?"). And for both questions, the five answer options (I have not been bullied (or bullied (an)other student(s)) at school in the past couple of months / It has only happened once or twice / 2 or 3 times a month / About once a week / Several times a week) were

dichotomized to “never” and “at least once in the past couple of months”. Thus, three categories of students were defined for the present analyses: those not involved, victims, and bully-victims.

To identify students with D/CI the following question, adapted from Finnish and Canadian 2001/2002 HBSC surveys [29], was used: “Do you have a long-term illness, disability or medical condition (like diabetes, arthritis, allergy or cerebral palsy) that has been diagnosed by a doctor?” with the response options of yes or no. A subsequent question allowed identification of children for whom their D/CI restricted attendance or participation at school: “Does your long-term illness, disability or medical condition affect your attendance and participation at school?”. Students were then classified into three mutually exclusive categories as non D/CI students, D/CI without restriction in participation and D/CI with restriction in participation.

In addition, four groups of confounding variables were considered to be determinants of both bullying-victimization and perception of health: socio-demographic, individual, social and family factors [8, 23, 25, 30]. Socio-demographic factors included age group, gender and family affluence (assessed by the validated Family Affluence Scale [31] through a composite score used as an ordinal indicator of affluence: high, middle and low). Individual factors included body image and school-related stress. The quality of the social network was investigated by two indicators: one item on communication with same-sex friends and social support from classmates, measured by a three-items scale developed for HBSC (“The students in my class(es) enjoy being together”/ “Most of the students in my class(es) are kind and helpful”/ “Other students accept me as I am”). Family factors were represented by family structure and communication with mother and father considered separately. More information related to these items is available in Currie [28].

Statistical analyses

Multilevel logistic regression analyses (random intercept) were computed to take into account the hierarchical structure of the data (individuals clustered within schools within countries). To estimate the risk for reporting a poor health outcome (i.e. fair or poor general health, low life satisfaction, two or more symptoms more than once a week) associated with bullying-victimization according to the D/CI status, the interaction terms between these both factors were tested in adjusted logistic regression models. Similar analyses were repeated for each of the three dichotomized health outcomes. All confounding variables that were thought to be important or that were significant in univariate analyses with p-value<0.2 were included in the

adjusted models (gender, age, family affluence, body image, family structure, communication with mother, communication with father, social support, communication with same sex friends, pressured by school work). All of the analyses were performed with Stata 9.2. [32] and the GLLAMM command [33] was used to implement the multilevel logistic regression models. Confidence Intervals (CIs) were computed at the 95% level and statistical significance was established at p-value<0.05.

RESULTS

Prevalence of D/CI and bullying-victimization

The population sample analyzed consisted of 55,030 students with 49.1% of boys. Prevalence of students reporting D/CI was 17.7% and varied across countries, from 14.3% in Bulgaria to 27.1% in Germany. Overall, 34.4% (95% CI 34.0-34.8) of students reported having been bullied at least once in the past couple of months (of whom 51.4% also reported to bully others), with a large country variation, ranging from 25.9% in Ireland to 48.3% in Latvia (**Table 1**). The percentage of students being bullied was consistently and significantly higher among those reporting D/CI than among others; the smallest relative prevalence difference between the two groups was observed in Portugal (+11.8%) and the largest in Poland (+39.2%).

Prevalence of subjective health indicators

Overall, 41.5% of the respondents reported at least one of the following three health problems: poor/fair general health, low life satisfaction and multiple psychosomatic symptoms. This percentage was significantly higher among students with D/CI compared to others (53.9% (52.9-54.9) vs. 38.8% (38.3-39.3)); as well as among victims of bullying (including victims and bully-victims) compared to others (52.0% (51.3-52.7) vs. 35.9% (35.4-36.4)). Regardless of each health outcome, the same patterns were observed and students with D/CI were more likely to report negative subjective health than other (respectively, poor/fair general health: 24.7% vs. 12.3%; low life satisfaction: 20.7% vs. 14.9%; multiple health symptoms: 39.8% vs. 27.6%). These differences were even greater among students with D/CI who also reported restriction in participation at school (**Table 2)**. **Table 2** shows also the percentage of each health outcome according to bullying behaviors. For the three outcomes,

victims of bullying rated their health more negatively than those not involved, and the percentage were even higher for bully-victims.

Multilevel logistic regressions

A null model was tested for the three health indicators without inclusion of any predictor and the random variance component suggested that variations between countries as well as schools were significant (not presented). Three-level (country/school/student) multilevel logistic models were performed to investigate the association between bullying-victimization and poor subjective health, controlling for confounding factors. The risk for victims of bullying (separately for victims and bully-victims) to report poor subjective health, compared to those not involved in any bullying behavior, among students reporting D/CI (without or with restriction in participation) or not, is presented with Odds Ratios (ORs) in **Table 3**. One interaction term was found significant for victims, indicating that these students were more likely to report having multiple health symptoms if they did not report D/CI (OR 1.8 (1.7-2.0)), whereas no significant association was found for those reporting D/CI with restricted participation (OR 1.3 (1.0-1.7)) (interaction term p-value: 0.012). For bully-victims, relationship between bullying-victimization and multiple health symptoms tended also to be lower among students reporting D/CI with restriction in participation compared to those without D/CI, but without statistic significance. On the contrary, victimization was significantly associated with poor/fair general health and low life satisfaction for all students, with a trend of a stronger association for students reporting D/CI with restriction in participation at school compared to others.

DISCUSSION

Regardless of the country, students reporting a D/CI were more often exposed to bullying-victimization at school. Overall, the relationship between being bullied and students' subjective health and well-being was similar for students with and without chronic illnesses or disabilities. The strength of the association between bullying-victimization at school and multiple health complaints was significantly weaker for victims who reported D/CI with restricted participation than among those who did not report D/CI. These findings don't support the hypothesis stated initially.

According to our findings, bullying-victimization is a common experience among school children in many countries, and students reporting disability or chronic illness are at higher risk of being victimized in all countries studied. This result is consistent with our exploratory research carried out in France and Ireland [10], and with others researches where higher rates of victimization were found among children with chronic condition or special health needs [8, 9, 11, 34]. Thus, our result confirms that students with disability are a potentially easier target for bullying. Different hypotheses are stated to explain why these adolescents are victimized more often than others without no such health challenges. Some have said that students with chronic conditions may be more likely victims of bullying because of a difference in appearance, or in behaviors (i.e. mannerism, speech patterns, special care), others attributed it to students with D/CI having more psycho-social difficulties leading inn turn to difficulties to interact with peers [11, 34]. Dawkins [35] reported that children with physical disability were overall more likely to be bullied; however, this association was no more significant after adjustment on element from the child's environment. Adolescents with less visible disability (e.g. epilepsy) don't reveal their conditions because it leads to misunderstanding from peers and to exclusion from the group [1]. Whatever the hypothesis, the interaction between the chronic condition and the environment of the adolescent might best predict bullying than the actual impairment [12].

Cross-national variations in bullying-victimization among children and adolescents were previously reported across countries [2, 8], and significant variations were also showed between countries in terms of trends of bullying-victimization over time [3]. However, there are similarities in associated factors with being bullied between countries, and students who are victims of bullying are more likely to have lower psychological well-being, more sadness and emotional instability in most of countries [8].

Overall, in our study, bullying-victimization had a similar relationship with health perception of students reporting a disability or chronic illness and on those who do not report such condition. But we noticed some patterns regarding our subjective health indicator. Victimization was consistently associated with a fair/poor general health and a low life satisfaction and the association tended to be higher among students reporting D/CI with restriction in participation compared to other. At the contrary, no significant association was found between bullying-victimization and multiple psychosomatic symptoms among victims reporting D/CI with restriction in participation. The relationship between a dissatisfied level

of life satisfaction and victimization due to disability was also recently described [36]. General health and life satisfaction account for positive evaluation of life as a whole [21], whereas health complaints are defined as a response to potentially psychosocial stresses [37]. As highlighted by Kerr [36], adolescents could be dissatisfied by life without showing any psychosomatic symptoms, and reciprocally.

Interestingly, while we found strong associations between bullying-victimization and multiple health complaints among students reporting D/CI, the same was not found among students reporting D/CI with restriction in participation at school. Restricted participation is used in this study as an indicator for the most severe chronic illness and disability [10], and that these students may frequently deal with symptoms due to their condition [1], hence we might assume that victimization will impact rather on their global well-being, through lower perceived health and life-satisfaction, than through the expression of psycho-somatic complaints, yet our study does not support that assumption. It could, therefore, be that school restriction is indicative of something else, perhaps family organization, other than severity of the disability.

Lastly, our findings showed few differences between victims and bully-victims, except regarding our main results, as the relationship between bullying-victimization and subjective health was statistically similar whatever the D/CI status reported by students. Overall, the strength of this association tended to be stronger for bully-victims compared to victims. This is consistent with other findings describing bully-victims as particularly at risk for psychological and psychosomatic symptoms [24]. Additionally, it was found that bully-victims were significantly more likely to be boys [24] (in our sample: 57% among bully-victims vs. 43% among victims), thus given that gender difference was observed in terms of forms of bullying [25], it might be interesting to explore the association with subjective health taking into account the type of bullying.

The main strength of this study is that, to our knowledge, it is the first to compare the relationship between bullying-victimization and subjective health, through different dimensions, between students reporting D/CI and others. Another strength is the large representative sample of Western countries, standardized validated research methods, translations quality controls and a common operational definition of bullying. Indeed, the common protocol of the study for all participant countries and the preamble in our

questionnaire describing bullying in a complete and clear fashion providing a common operational definition, allowed confidence in the findings. However, this study has some limitations. The first is related to the disability and chronic illness self-reported by students. Comparisons with previous studies on disability and chronic conditions among students are difficult because of the diversity in measurement and definition used [38]. Several studies based on different sources indicated that allergy and asthma are the most commonly reported chronic condition in childhood [11, 29]. Our previous findings [10] were consistent with the hypothesis that in our sample, a higher proportion of students with most severe chronic illness and disability are to be found among those reporting D/CI with restricted participation at school, compared to those who reported D/CI without restriction. Secondly, the general measure of bullying cannot distinguish between different forms or types of bullying. Pittet [34] has shown differences between forms of bullying experienced by students with D/CI and other, thus it would be particularly interesting for future research to explore if the relationship between bullying and subjective health among students with disability is associated to one specific form of bullying. And last, the cross-sectional design doesn't allow to conclude about causal relations, even if a previous longitudinal study has indicated the reciprocity in the relationship between bullying-victimization and health-related symptoms among school-children [18].

The debate on the inclusive education was opened in 1994 with the adoption by several countries of the "Salamanca Statement and Framework for Action on Special Needs Education" [39]. The higher level of inclusion of children with chronic condition in mainstream education makes it important to pay attention to the quality of this inclusion. Health risk behaviors such as bullying are rarely studied among students with disabilities and this study should contribute to a better understanding of determinants of well-being and quality of life of this population. A holistic approach, taking into account the contextual determinants of health risk behaviors, is of central importance if we are to more fully understand health of young people and ultimately to design and implement efficient health promotion and public health programs targeted at students with chronic conditions.

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TABLES & FiGURES

Table 1. Prevalence of bullying-victimization (victims and bully-victims) according the country and the D/CI status

Country	n	Total % (CI 95%)	Among no D/CI [a] n=44,266 %	Among D/CI [a] n=9,490 %	Relative difference [b] %	Chi2 test p-value
Ireland	4,894	25.9 (24.7-27.2)	24.9	30.7	+23.6	<0.001
Poland	5,489	26.1 (24.9-27.3)	24.6	34.3	+39.2	<0.001
Netherlands	4,278	26.8 (25.4-28.1)	25.3	34.3	+35.4	<0.001
Wales	4,409	30.9 (29.5-32.3)	29.4	38.4	+30.7	<0.001
France	7,154	34.2 (33.1-35.4)	32.9	41.0	+24.9	<0.001
Canada	5,930	35.1 (33.9-36.4)	33.3	44.2	+32.6	<0.001
Germany	5,010	35.5 (34.1-36.8)	32.9	42.2	+28.4	<0.001
Bulgaria	4,854	35.7 (34.3-37.0)	33.9	45.6	+34.6	<0.001
Austria	4,848	40.8 (39.4-42.2)	38.8	50.3	+29.5	<0.001
Portugal	3,919	41.6 (40.1-43.2)	40.7	45.5	+11.8	<0.05
Latvia	4,245	48.3 (46.8-49.9)	47.1	53.1	+12.8	<0.001

[a] including D/CI without and with restriction in participation

[b] Relative difference = (% D/CI – % no D/CI) / % no D/CI

Table 2. Prevalence (%) of subjective health indicators across D/CI status and bullying behaviors

	n	Poor/fair general health n=54,661	Low life satisfaction n=54,339	Multiple health symptoms n=53,808
Disability or chronic illness				
No D/CI	44,819	12.3	14.9	27.6
D/CI without restriction	6,051	20.3	17.5	33.7
D/CI with restriction	2,841	35.6	27.7	52.8
Bullying				
Not involved	25,759	11.5	11.5	23.1
Victims	8,996	17.8	22.2	37.3
Bully-victims	9,516	19.2	22.8	40.0

Table 3. Odds Ratio estimates related to bullying-victimization (victims and bully-victims) from multilevel logistic regression analyses (school and country levels) for risk of reporting poor subjective health according to the level of disability

	Poor/fair general health		Low life satisfaction		Multiple health symptoms	
	Victims [a]	Bully-victims [a]	Victims [a]	Bully-victims [a]	Victims [a]	Bully-victims [a]
	Adjusted OR [b] (95% CI)		*Adjusted OR [b] (95% CI)*		*Adjusted OR [b] (95% CI)*	
	n= 26,016	n= 26,330	n=25,949	n=26,267	n= 25,754	n= 26,083
Among without D/CI	**1.4 (1.3-1.5)**	**1.5 (1.4-1.7)**	**1.8 (1.6-2.0)**	**1.8 (1.6-2.0)**	**1.8 (1.7-2.0)**	**2.2 (2.0-2.4)**
Among D/CI without restriction	**1.3 (1.0-1.6)**	**1.2 (1.0-1.5)**	**1.8 (1.4-2.3)**	**1.8 (1.4-2.2)**	**1.7 (1.4-2.0)**	**2.2 (1.8-2.6)**
Among D/CI with restriction	**1.6 (1.2-2.1)**	**1.4 (1.1-1.8)**	**2.1 (1.5-2.8)**	**1.9 (1.4-2.6)**	1.3 (1.0-1.7)	**1.7 (1.3-2.2)**
- interaction with D/CI without restriction (p-value)	ns	ns	ns	ns	ns	ns
- interaction with D/CI with restriction (p-value)	ns	ns	ns	ns	0.012	ns

[a] the reference category is "not involved in bullying"

[b] adjusted on: gender, age, family affluence, body image, family structure, communication with mother, communication with father, social support, communication with same sex friends, pressured by school work

Note: ORs significant at 5% level are in bold

Victims of bullying among students with a disability or chronic illness and their peers: A cross-national study between Ireland and France

Mariane SENTENAC[1], Aoife GAVIN[2], Catherine ARNAUD[1], Michal MOLCHO[2], Saoirse NIC GABHAINN[2], Emmanuelle GODEAU[1,3]

Introduction

- Students with disabilities or chronic illness (D/CI) have become increasingly integrated into mainstream schools, but negative attitudes are considered as a major barrier to full social inclusion of disabled students in school.
- School bullying is a common problem among students across countries and need to be studied among disabled students because there are more vulnerable.
- France and Ireland represent two contrasting environments in educational systems and bullying prevention at school.

Objectives

- To describe the level of bullying behaviours among children with and without D/CI in France and in Ireland
- To compare the relative strength of the associations between socio-demographic, social network, family factors and bullying victimization between students with or without D/CI across these countries
- To document the additional risk of bullying victimization associated with the level of D/CI

Health Behaviour in School-aged Children survey (HBSC)

- ✓ Based on the 2006 HBSC/WHO cross-national survey
- ✓ International protocol
- ✓ A nationally representative sample of students aged 11, 13 and 15 years in Ireland (n=4,894) and in France (n=7,154)
- ✓ Self-completion questionnaire, anonymous and voluntary

Bullying victimization at school

- A standardized introduction focused on the three elements defining bullying (Olweus 1993): repetition, harm, unequal power
- Being bullied at least once in the couple of months

Disability and chronic illness

- Long-term illness, disability, or medical condition that has been diagnosed by a doctor
- Restriction in participation at school due to D/CI

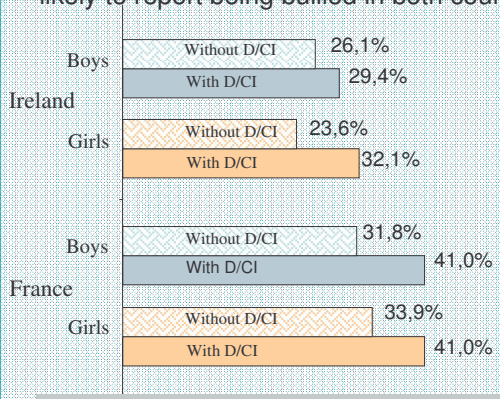
Contextual factors

- Socio-demographic: age, gender, family affluence
- Social network : social support, communication with same sex friends
- Family: family structure, communication with mother and father

Results

1. Overall, **in France 34.2%** of students reported being bullied at least once, vs. **25.9% in Ireland**.

2. Students with D/CI were significantly more likely to report being bullied in both countries



Prevalence of bullying victimization according to gender and D/CI status in Ireland and in France

3. Regardless of country and D/CI status, being bullied was significantly associated with **weaker social support** and **difficulty of communication with fathers**, with even stronger associations among students with D/CI.

4. Regardless the country, **30% additional risk** of being bullied was found when students reported both D/CI and restriction in school participation

Level of disability	n	OR[a] (95% CI)	p-value
No D/CI	7,259	1	
D/CI without restriction in participation	1,178	1.3 (1.1-1.4)	<0.01
D/CI with restriction in participation	314	1.8 (1.4-2.4)	<0.001
Ordinal assumption	8,751	1.3 (1.2-1.4)	<0.001

[a] adjusted for age, gender, FAS, communication with same sex friends, classmates support, family structure, communication with mother, communication with father and country.

Associations between bullying victimization and level of D/CI

Conclusion

- Despite differences variations observed in bullying rates, we found that students with D/CI are more likely to be victimized with a similar risk in Ireland and in France
- We found considerable similarities between countries and between D/CI status groups in the factors associated with being bullied. The specific role to the father in relation with bullying victimization is not documented in the literature and need to be explored in future qualitative researches
- We hypothesized that the level of disability was more severe when students reported that their D/CI had an impact on their school participation compared those reporting D/CI without such a restriction in participation, and our results affirm this.

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Bullying victimization and subjective health among disabled students : A cross-national study in 11 western countries

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Introduction

- Prevalence of school bullying varies across countries / contexts.
- The negative impact of bullying at school on students' health is well known.
- Children with disabilities are more vulnerable than others, hence a likely negative effect from their impairment and others factors, such as bullying, is expected on their health.
- Educational and social contexts interact with young people's behaviours (like bullying) and with their health.

Objectives

- To report prevalence of school bullying, and to compare this prevalence between students with a disability or chronic condition and others across countries;
- To compare the relationship between bullying victimization and perceived health among students reporting disability or chronic condition and others, whatever the country and the individual context.

Health Behaviour in School-aged Children survey (HBSC)

- ✓ Based on the 2006 HBSC/WHO cross-national survey
- ✓ International protocol
- ✓ Nationally representative sample of adolescents aged 11, 13 and 15 years from 11 western countries (n=55,030)
- ✓ Self-completion questionnaire, anonymous and voluntary
- ✓ Multilevel logistic regressions (country / school / student)

Bullying victimization at school

- A standardized definition of bullying was provided to allow confidence cross-national comparisons, focusing on the three elements defining bullying (Olweus 1993): repetition, harm, unequal power
- Being bullied at least once in the couple of months was assessed

Subjective health

3 complementary outcomes exploring different aspects of subjective health were used:

- *Self-related health* → assessment of global health perception
- *Life satisfaction* → cognitive evaluation of ones life
- *Psychosomatic symptoms* → response to stressful situations

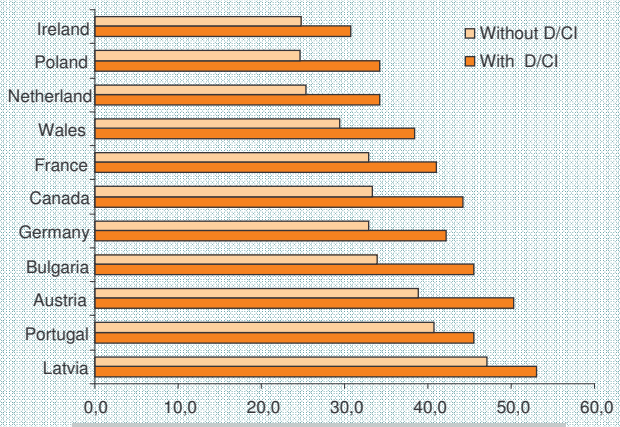
Disability and chronic illness (D/CI)

Disabled students were identified by the following question: *"Do you have a long-term illness, disability, or medical condition (like diabetes, arthritis, allergy or cerebral palsy) that has been diagnosed by a doctor?"*

Results

1. Overall, **34.4%** of students reported being bullied at least once, with a large variation across countries (from **25.9% in Ireland** to **48.3% in Latvia**).

2. The prevalence of students reporting being bullied was consistently higher among students reporting a D/CI compared to others, in all countries



Prevalence of students who have being bullied at least once according to D/CI status

3. Whatever the age, **the risk for reporting a poor/fair general health and a poor life satisfaction among victims of bullying is similar for students with D/CI and for others**. Whereas, 11-years old reporting to be a victim of bullying were more likely to report having 2 or more symptoms more than once a week if they didn't report D/CI (**OR: 2.1(1.8-2.4)**) than if they reported D/CI (**OR:1.5(1.1-2.0)**) (interaction p-value=0.034).

	Poor/fair general health *Adjusted OR * (95% CI)*	Poor life satisfaction *Adjusted OR* (95% CI)*	Health complaints *Adjusted OR* (95% CI)*
11 year-olds			
- without D/CI	1.5 (1.3-1.8)	2.3 (1.9-2.7)	2.1 (1.8-2.4)
- with D/CI			1.5 (1.1-2.0)
13 year-olds			
- without D/CI	1.7 (1.4-2.0)	2.0 (1.7-2.3)	1.7 (1.5-2.0)
- with D/CI			
15 year-olds			
- without D/CI	1.3 (1.2-1.6)	1.6 (1.4-1.8)	1.7 (1.5-1.9)
- with D/CI			

* adjusted on : age, gender, fas, talking to mother, talking to father, family structure, peer support, talking to same sex friends, BMI, pressured by schoolwork

Risk for reporting a poor subjective health outcomes associated to bullying victimization according to the D/CI status

Conclusion

- Adolescences reporting a D/CI are more vulnerable toward bullying at school; this whatever the country bullying context.
- The impact of bullying is negative on adolescence's subjective health and well-being, as much as for non D/CI students than for D/CI students in terms of general perception of health and life satisfaction.
- The strength of the association between bullying victimization at school and health complaints is weaker for students aged 11 years who reported D/CI than for others who didn't report D/CI.

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