BMJ Open Role of optimism in adolescent mental health: a protocol for a systematic review

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ABSTRACT

Introduction Adolescence is a critical period of human development, where adaptive or maladaptive experiences can happen. These experiences are associated with psychological, social, biological and health factors. Previous empirical evidence suggests that mental health is associated with individual assets and positive states, whose presence may become a factor of protection and resistance to mental disorders. Among these, optimism could play a fundamental role in sustaining physical and mental well-being and in dealing with threats potentially harmful to health. Given the rise of research on optimism and its importance in the various health outcomes, it is necessary to initiate processes of compilation and synthesis of this evidence to facilitate the understanding of the importance of this variable on the mental health of adolescents.

Methods and analysis The included studies will be experimental, observational, cross-sectional and longitudinal focussed on the role of optimism on mental health in adolescents, regardless of whether they belong to clinical or non-clinical populations. This systematic review protocol will be carried out following the Cochrane Manual for systematic reviews and will follow the statement on systematic reviews and meta-analysis of PRISMA-P (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols). Searches will run from October 2019 to March 2020, and will be carried out from the following electronic databases: APA PsycNet, BVS (Biblioteca Virtual em Saúde), Web of Science, PubMed Central and Scopus. Two reviewers will obtain the eligible articles, published from January 2009 onward, to assess the quality of each study and extract the data. For the presentation of the results, a narrative and quantitative synthesis will be carried out that groups the data found.

Ethics and dissemination The approval of an ethics committee is not required for a systematic review protocol. The results will be presented at congresses in social sciences and psychology and will be published in a peer-reviewed social or health science journal.

PROSPERO registration number PROSPERO CRD42019142616.

INTRODUCTION

Mental health is a state of well-being in which the person performs his abilities and can cope with the normal stresses of life, work

Strengths and limitations of this study

- This review represents the first effort to collect empirical evidence that supports the association between mental health and optimism, which has been a field widely explored.
- This review will include studies in three languages: English, Portuguese and Spanish, with the purpose to collect the largest amount of studies as possible.
- A possible weakness of this review may be the non-inclusion of bibliographic material other than original research articles (dissertations, books, chapters, reports, conference material, opinion pieces, commentary and reviews).

productively and contribute to their community.¹ Approximately 10% of the world population and 20% of the children and adolescents are affected by some mental disorders.² In this way, mental disorders represent 10% of the global burden of morbidity and mortality and 30% of the non-fatal diseases.^{2,3} The high prevalence rates, increased morbidity and immense economic and human resources invested in the care of diseases and mental health problems have become a high burden for societies worldwide.³

Various difficulties that alter mental health in the general population tend to appear at the end of childhood and the beginning of adolescence,^{4,5} extending its prevalence until adulthood.^{6,7} The suffering of mental disorders can have important effects on overall health and adolescent development. It is associated with various psychosocial and health problems such as the consumption of psychoactive substances,⁸ risky sexual behaviours,⁹ violent behaviours,¹⁰ school mismatch¹¹ and criminal behaviours.¹² Similarly, studies have shown that adolescent mental health is associated with individual assets such as positive identity,¹³ social competence,¹⁴ the resilience¹⁵ and positive values.¹⁶ In recent decades, the rise of positive psychology as a scientific study

of positive experiences has highlighted the importance of positive states, such as optimism, in the construction of psychological, intellectual and social resources during the positive development of people,^{17 18} which can lead them to experience benefits and satisfaction in several domains of their vital functioning (work, physical and mental health, interpersonal relationships).^{19 20}

Optimism is a construct that has been empirically measured and validated in the field of study of positive psychology, which is considered a generally stable personality facet, of cognitive nature and related to motivation, that reflects the extent to which people have generalised favourable expectations for their future.^{21–23} Its relationship with various areas of human well-being has been explored in various contexts over the past 30 years.^{24 25} Evidence has indicated that levels of optimism in people influence how they face health threats^{26 27} therefore, it has been described as a factor of protection, resilience and coping mechanism against adversity and disease.^{28 29} In adolescence, the development of optimism occurs,³⁰ favouring the psychological and physical well-being of adolescents^{31 32} and thus becoming an active potential for the maintenance of mental and physical health.³³

According to the evidence, optimism works as a protective factor in mental health during adolescence.³⁴ Thus, for example, adolescents with high levels of optimism have a lower risk of experiencing depressive symptoms,³⁵ anxious episodes,³⁶ suicidal ideation and behaviour³⁷ and a lower tendency towards risk behaviours, such as consumption or abuse of psychoactive substances.³⁸ Similarly, some studies have identified the importance of optimism as a predictor of good socio-emotional adjustment and functioning³⁹ and positive adaptation to the negative impact of stress in adolescence.⁴⁰ Besides, its moderating effect has been reported among the results associated with psychological well-being in adolescents, in which, for example, high levels of optimism significantly moderate the relationship between low suffering and high psychological well-being.^{41 42}

To date, there have been several systematic reviews that report the underlying functions of optimism on health. These results include reviews on the importance of optimism in the treatment of chronic diseases,⁴³ in preventing the risk of acquiring a physical illness,⁴⁴ in its relationship with quality of life and well-being amid illness,⁴⁵ as a factor that contributes to adaptation to chronic diseases⁴⁶ and its role in post-traumatic growth related to physical illness.⁴⁷ Although these reviews report on the role of optimism in health, there are still few systematic reviews focussed on the relationship of optimism with mental health or some of its components (mental disorders, psychological well-being and psychosocial factors).^{48–50} However, their findings have focussed on understanding this relationship in clinical populations and mainly in adult subjects.

To contribute to the understanding of the role and underlying functions of optimism in mental health and thus fill these gaps, the present systematic review will be carried out, to understand the role of optimism on mental health in adolescence. This is to update existing

reviews and complement the empirical data collected through the incorporation of various mental health outcomes (psychological distress, lifestyles, psychological development and psychological well-being) related to optimism in adolescents. Furthermore, these results will facilitate the construction of early and evidence-based interventions for clinical care in mental health in adolescence. Therefore, the key questions of this protocol are the following: What is the role of optimism in adolescent mental health? What is the contribution of optimism in the prevention of psychological distress in adolescents?

OBJECTIVE

The objective is to prepare a protocol for a systematic review that determines the role of mental health optimism in adolescence, regardless of whether they belong to clinical or non-clinical populations, in empirical evidence published from 2009 onward.

METHODS AND ANALYSIS

This systematic review will be carried out following the Cochrane Manual for Systematic Reviews⁵¹ and the data obtained will be reported from the guidelines and recommendations of the model 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols' (PRISMA-P).⁵² Citations and references will be managed in Mendeley and the data will be extracted and managed in the tool Systematic Review Data Repository (SRDR) from the agency for Healthcare Research and Quality. This review has been registered in the International Prospective Registry of Systematic Reviews - PROSPERO.

Eligibility criteria

Types of studies

The type of studies included will be experimental studies (randomised controlled trials), observational studies (cohort and case-control), cross-sectional and longitudinal that examine the role of optimism in adolescent mental health. Likewise, the review will include full and available free of charge for downloads studies, published in Spanish, English or Portuguese from January 2009 onward. Dissertations, books, chapters, reports, conference material, opinion pieces, commentary and reviews will be excluded from the review, since this type of literature could contain anecdotal or reflexive evidence based on primary studies that could duplicate or skew the results found in the searches. Furthermore, the validation of instruments and scales will also be excluded. A new search will be conducted before the final analysis to retrieve other studies for review and possible inclusion.

Types of participants

This review will consider participants that are female or male adolescents, aged between 13 and 18, regardless of whether they belong to a clinical or non-clinical population.

Patient and public involvement

No patient involved.

Types of outcome measures

The results may represent an outcome that indicates or report on the relationship, influence or contribution of optimism on mental health in adolescence. Likewise, the review will consider outcome measure that examines the role of optimism in adolescence that includes at least one psychological distress outcome (p. for example, depression, stress, anxiety, negative emotions); patterns of behaviour and/or cognition (p. for example, risky or protective behaviours, disruptive or prosocial behaviours, dysfunctional and adaptive thoughts), lifestyles (eg, healthy habits and practices), psychological development (eg, self-esteem, self-concept, psychological processes) or psychological well-being (eg, positive affect and emotions, satisfaction or subjective well-being).

Search strategies

Electronic searches

The databases will be searched from October 2019 to March 2020 and will be carried out from the following electronic databases: APA PsycNet (American Psychological Association), BVS (Biblioteca Virtual em Saúde), Web of Science (Science and Social Science Citation Index), PubMed Central and Scopus.

Search criteria

The controlled vocabulary browser was used for the search strategy MeSH (Medical Subject Headings) for the establishment of the following keywords: *optimism*, *adolescent*, *mental health* and *adolescent's health*. Additionally, Boolean

operators were used to specifying the syntactic structure of the search terms, which were tested and established for all databases. Table 1 presents the full search criteria.

Study records

Selection process

All search results will be imported into Mendeley software to manage data and eliminate duplicates. Two independent reviewers will make a preliminary selection of titles and summaries of the texts for inclusion and exclusion. Subsequently, the full text will be obtained and two reviewers will apply the inclusion and exclusion criteria to identify the relevant studies that will be included in the systematic review analysis. Discrepancies will be resolved in consensus with the intervention of the third reviewer.

Data extraction process

The data will be extracted by two reviewers using a standardised extraction form previously designed in the SRDR. The following data will be collected: type of study (randomised controlled trials, cross-sectional, longitudinal, prospective, cohort and case-control); objective and purposes of the research process; characteristics of the participants; context (clinical, academical, public health, judicial—penitentiary, sport environment, other); methods of each study (design, notified and observed methodological limitations, recruitment allocation, data collection and analysis methods); primary and secondary outcomes and the main conclusions of the study. After extracting the data, two of the reviewers will deal with any disagreement through consensus and, if necessary, with the involvement of a third reviewer.

Table 1 Full search criteria for electronic databases

Keywords	Numeration	Search criteria
Optimism	1.	Optimism*
	2.	MeSH descriptor Optimism (this term only)
	3.	#1 OR #2
Adolescent	4.	Adolescent*
	5.	MeSH descriptor Adolescent (this term only)
	6.	Teenager*
	7.	pre-teen*
	8.	Young*
	9.	#5 OR #6 OR #7 OR #8
	10.	#3 AND #9
Adolescent health	11.	Adolescent* Health
	12.	MeSH descriptor Adolescent Health (this term only)
Mental Health	13.	MeSH descriptor Mental Health (this term only)
	14.	State* Mental*
	15.	#11 OR #12 OR #13 OR 14
	16.	#3 AND #9 AND #15

MeSH, Medical Subject Headings.

Quality assessment

The quality assessment of the studies will be assessed using the Newcastle-Ottawa Scale and adapted version for cross-sectional and observational studies.^{53 54} For randomised controlled trials, quality will be performed using the Cochrane Collaboration's risk of bias tool (RoB 2).⁵⁵ Two reviewers will independently evaluate each study and a third reviewer will be included to resolve any discrepancies.

Data synthesis

In this review, findings will be presented and synthesised using a narrative and thematic synthesis approach. The synthesis will present detailed comments and interpretations of the extracted data, having found the measures described in the section of the process of gathering and extracting the information. Thus, categories of analysis will be structured according to the central theme of the review which, will allow mainly the understanding of the role of optimism on the mental health of adolescents.

After performing the systematic review, if data are pertinent for quantitative analysis, we will use a meta-analytical approach. Depending on the results of heterogeneity assessment between studies, we will select the fixed model or random effects model. The I^2 statistic (and 95% CI) will be used to assess the heterogeneity of the studies. This statistic will be interpreted using the following suggested classification: low (25% to 49%), moderate (50% to 74%) and high ($\geq 75\%$) heterogeneity.⁵⁶ The significance of the heterogeneity will be calculated using the χ^2 test with Cochran's Q statistic ($p < 0.05$).⁵⁷ Additionally, if meta-analysis is feasible we will conduct a subgroup analysis based on participant characteristics such as: sex, ethnicity, outcome measures, care setting and intervention characteristics. All statistical analyses will be performed using the Cochrane Collaboration's software (RevMan V.5.3).⁵⁸

Ethics and dissemination

The review will search and evaluate primary sources obtained in previous researches; therefore, no formal approval from an ethics committee is required. The results of the systematic review will be published in an international peer-reviewed journal. Likewise, the authors will plan a presentation at possible national or international conferences to disseminate the results among the academic community.

DISCUSSION

Optimism has been increasingly explored in health research, finding relevant data on its relationship with results of interest in the medical and psychological field. The results of this systematic review are expected to provide a detailed and synthesised description of the role of optimism in mental health in adolescence. The determination of the influence of positive individual assets such as optimism in the mental health of adolescents will have important implications for the development of early

interventions and the configuration of clinical and public health practices based on scientific evidence.

The proposed systematic review will be reported following the systematic statement and meta-analysis of PRISMA-P (2015). Any correction or improvement made to this protocol during the development of the study will be reported in PROSPERO and will be indicated in the final report. The strengths of this review are: the inclusion of studies applied in the adolescent population and different human contexts (clinical, sports, educational, public health) and the inclusion of studies in three languages: English, Portuguese and Spanish from January 2009 onward. On the other hand, the main limitation of this review is the non-inclusion of grey literature (dissertations, books, chapters, reports, conference material, opinion pieces, commentary and reviews), which could omit important information that could contribute to the development of this review. However, due to the accumulation of published empirical data, resulting from basic research on the subject in question, its collection may be representative of the review.

Contributors FARU contributed to the conception of this systematic review. The manuscript of the protocol was drafted by FARU and CANE and revised by JdSP. All authors developed to search and assessment strategies. All authors read and commented critically on each draft of the manuscript. Finally, all authors approved the final manuscript.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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REFERENCES

- 1 World Health Organization. *Mental health: strengthen our response*, 2018.
- 2 World Health Organization. *Mental health atlas*. Geneva: World Health Organization, 2018.
- 3 World Health Organization. *Out of the shadows: making mental health a global development priority*. Washington, DC: World Health Organization, 2016.
- 4 Sellers R, Warne N, Pickles A, et al. Cross-Cohort change in adolescent outcomes for children with mental health problems. *J Child Psychol Psychiatry* 2019;60:813–21.
- 5 Sulistiowati NMD, Keliat BA, Wardani IY, et al. Comprehending Mental Health in Indonesian's Adolescents through Mental, Emotional, and Social Well-Being. *Compr Child Adolesc Nurs* 2019;42:277–83.
- 6 Schaefer JD, Caspi A, Belsky DW, et al. Enduring mental health: prevalence and prediction. *J Abnorm Psychol* 2017;126:212–24.

- 7 Heflin C, Kukla-Acevedo S, Darolia R. Adolescent food insecurity and risky behaviors and mental health during the transition to adulthood. *Child Youth Serv Rev* 2019;105:104416–11.
- 8 Mason M, Mennis J, Russell M, et al. Adolescent depression and substance use: the protective role of prosocial peer behavior. *J Abnorm Child Psychol* 2019;47:1065–74.
- 9 Adan Sanchez AY, McMillan E, Bhaduri A, et al. High-Risk sexual behaviour in young people with mental health disorders. *Early Interv Psychiatry* 2019;13:867–73.
- 10 Sigel EJ, Mattson SA, Mercado MC. Increased violence involvement and other behavioral and mental health factors among youth with firearm access. *J Adolesc Health* 2019;65:63–71.
- 11 Vargas B, Leiva L, Rojas-Andrade R, Rojas R, et al. Effects of psychosocial adversity on school maladjustment: a follow-up of primary school students. *Psicol Educ* 2019;25:101–8.
- 12 Hein S, Barbot B, Square A, et al. Violent offending among juveniles: a 7-year longitudinal study of recidivism, desistance, and associations with mental health. *Law Hum Behav* 2017;41:273–83.
- 13 Min MO, Yoon D, Minnes S, et al. Profiles of individual assets and mental health symptoms in at-risk early adolescents. *J Adolesc* 2019;75:1–11.
- 14 Szwedo DE, Chango JM, Allen JP. Adolescent romance and depressive symptoms: the Moderating effects of positive coping and perceived friendship competence. *J Clin Child Adolesc Psychol* 2015;44:538–50.
- 15 Gloppen K, McMorris B, Gower A, et al. Associations between bullying involvement, protective factors, and mental health among American Indian youth. *Am J Orthopsychiatry* 2018;88:413–21.
- 16 Bleck J, DeBate R. Long-Term association between developmental assets and health behaviors: an exploratory study. *Health Educ Behav* 2016;43:543–51.
- 17 Afalah A, Alganem A. The impact of construal level on happiness, hopes, optimism, life satisfaction and love of life: a longitudinal and experimental study. *Aust J Psycho* 2019;1–9.
- 18 Chang EC, Chang OD, Li M, et al. Positive emotions, hope, and life satisfaction in Chinese adults: a test of the broaden-and-build model in accounting for subjective well-being in Chinese college students. *J Posit Psychol* 2019;14:829–35.
- 19 Fredrickson BL. The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *Am Psychol* 2001;56:218–26.
- 20 Armenta CN, Fritz MM, Lyubomirsky S. Functions of positive emotions: Gratitude as a motivator of Self-Improvement and positive change. *Emot Rev* 2017;9:183–90.
- 21 Sharpe JP, Martin NR, Roth KA. Optimism and the big five factors of personality: beyond neuroticism and extraversion. *Pers Individ Dif* 2011;51:946–51.
- 22 Alarcon GM, Bowling NA, Khazon S. Great expectations: a meta-analytic examination of optimism and hope. *Pers Individ Dif* 2013;54:821–7.
- 23 Carver CS, Scheier MF, optimism D. Dispositional optimism. *Trends Cogn Sci* 2014;18:293–9.
- 24 Carver CS, Scheier MF, Segerstrom SC. Optimism. *Clin Psychol Rev* 2010;30:879–89.
- 25 Bouchard C, Carver S, Mens C, et al. Optimism, health, and well-being. In: Dunn D, ed. *Frontiers of social psychology: positive psychology: established and emerging issues*. New York: Routledge/Taylor & Francis Group 2018, 2018: 112–30.
- 26 Uchida Y, Kitayama S, Akutsu S, et al. Optimism and the conserved transcriptional response to adversity. *Health Psychol* 2018;37:1077–80.
- 27 Schou I, Bonsakse T, Heir T, et al. Optimists report fewer physical and mental health conditions than pessimists in the general Norwegian population. *Health Psychol Rep* 2019;7:1–10.
- 28 Kleiman EM, Chiara AM, Liu RT, et al. Optimism and well-being: a prospective multi-method and multi-dimensional examination of optimism as a resilience factor following the occurrence of stressful life events. *Cogn Emot* 2017;31:269–83.
- 29 Gallagher MW, Long LJ, Richardson A, et al. Resilience and coping in cancer survivors: the unique effects of optimism and mastery. *Cognit Ther Res* 2019;43:32–44.
- 30 Renaud J, Barker ET, Hendricks C, et al. The developmental origins and future implications of dispositional optimism in the transition to adulthood. *Int J Behav Dev* 2019;43:221–30.
- 31 Scheier MF, Carver CS. Effects of optimism on psychological and physical well-being: theoretical overview and empirical update. *Cognit Ther Res* 1992;16:201–28.
- 32 Ho MY, Cheung FM, Cheung SF. The role of meaning in life and optimism in promoting well-being. *Pers Individ Dif* 2010;48:658–63.
- 33 Häggström Westberg K, Wilhsson M, Svedberg P, et al. Optimism as a candidate health asset: exploring its links with adolescent quality of life in Sweden. *Child Dev* 2019;90:970–84.
- 34 Patton GC, Tollit MM, Romaniuk H, et al. A prospective study of the effects of optimism on adolescent health risks. *Pediatrics* 2011;127:308–16.
- 35 Ames ME, Rawana JS, Gentile P, et al. The protective role of optimism and self-esteem on depressive symptom pathways among Canadian Aboriginal youth. *J Youth Adolesc* 2015;44:142–54.
- 36 Dooley B, Fitzgerald A, Giolabhui NM. The risk and protective factors associated with depression and anxiety in a national sample of Irish adolescents. *Ir J Psychol Med* 2015;32:93–105.
- 37 Tanner AK, Hasking P, Martin G. Effects of rumination and optimism on the relationship between psychological distress and non-suicidal self-injury. *Prev Sci* 2014;15:860–8.
- 38 Ansari H, Khammaria M, Okati H, et al. The role of optimism in predicting tobacco smoking and illicit drug use among high school students in Southeast of Iran. *Health Scope* 2019;8:1–8.
- 39 Okado Y, Howard Sharp KM, Tillery R, et al. Profiles of dispositional Expectancies and Affectivity predict later psychosocial functioning in children and adolescents with cancer. *J Pediatr Psychol* 2016;41:298–308.
- 40 Eicher V, Staerklé C, Clémence A. I want to quit education: a longitudinal study of stress and optimism as predictors of school dropout intention. *J Adolesc* 2014;37:1021–30.
- 41 Lai JCL. Dispositional optimism buffers the impact of daily hassles on mental health in Chinese adolescents. *Pers Individ Dif* 2009;47:247–9.
- 42 Kaiser A, Malik S. Emotional maltreatment as predictor of mental health problems among adolescents: Moderating role of optimism. *Behav Sci* 2015;25:129–44.
- 43 Schiavon CC, Marchetti E, Gurgel L, et al. Optimism and hope in chronic disease: a systematic review. *Front Psychol* 2016;7:1–10.
- 44 Rozanski A, Bivishi C, Kubzansky LD, et al. Association of optimism with cardiovascular events and all-cause mortality: a systematic review and meta-analysis. *JAMA Netw Open* 2019;2:e1912200.
- 45 Roat M, Hutz C. Otimismo E suporte social em mulheres CoM câncer de mama: uma revisão sistemática. *Psicol teor prat* 2016;18:19–33.
- 46 O'Brien CW, Moorey S. Outlook and adaptation in advanced cancer: a systematic review. *Psychooncology* 2010;19:1239–49.
- 47 Bostock L, Sheikh AI, Barton S. Posttraumatic growth and optimism in health-related trauma: a systematic review. *J Clin Psychol Med Settings* 2009;16:281–96.
- 48 Leamy M, Bird V, Le Boutillier C, et al. Conceptual framework for personal recovery in mental health: systematic review and narrative synthesis. *Br J Psychiatry* 2011;199:445–52.
- 49 Evans EC, Bullock LFC. Optimism and other psychosocial influences on antenatal depression: a systematic review. *Nurs Health Sci* 2012;14:352–61.
- 50 Chakhssi F, Kraiss JT, Sommers-Spijkerman M, Sommers M, et al. The effect of positive psychology interventions on well-being and distress in clinical samples with psychiatric or somatic disorders: a systematic review and meta-analysis. *BMC Psychiatry* 2018;18:1–17.
- 51 Higgins J, Green S. *Cochrane Handbook for systematic reviews of interventions version 5.1.0*. The Cochrane Collaboration, 2011.
- 52 Moher D, Shamseer L, Clarke M, Gersh D, Liberati A, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev* 2015;4:1–9.
- 53 Wells G, Shea B, O'Connell D, et al. *The Newcastle-Ottawa scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses*. Ottawa, ON: Ottawa Hospital Research Institute, 2011.
- 54 Herzog R, Álvarez-Pasquin Mª José, Díaz C, et al. Are healthcare workers' intentions to vaccinate related to their knowledge, beliefs and attitudes? a systematic review. *BMC Public Health* 2013;13:1–17.
- 55 Sterne JAC, Savović J, Page MJ, et al. Rob 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019;2:l4898–8.
- 56 Higgins JPT, Thompson SG. Quantifying heterogeneity in a meta-analysis. *Stat Med* 2002;21:1539–58.
- 57 Higgins JPT, Thompson SG, Deeks JJ, et al. Measuring inconsistency in meta-analyses. *BMJ* 2003;327:557–60.
- 58 RevMan. *Review Manager (RevMan) [Computer program]*. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.