

Analysis of contents about sexuality and human reproduction in school textbooks of Spain

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ABSTRACT**Objectives**

The spread of sexually transmitted infections (STI) in adolescents and teenage pregnancy rates are increasing. A decrease in the average age of youth's first sexual experience is also being noted. Sexual education programs in schools have an important role to play in addressing these issues. The objective of this study is to analyze the content of textbooks in the area of sexuality and human reproduction in order to evaluate the extent to which these textbooks promote healthy reproductive life styles, as well as risk behavior avoidance among the adolescent students.

Study design

Descriptive study of school textbooks content.

Methods

The study sample consisted of 12 textbooks (about 80% of all the textbooks) used in Spanish secondary school and edited in 2002. A content analysis evaluated the extent to which these books demonstrated reliable scientific information about: a) condom effectiveness; b) consequences, prevention, and treatment of STI; c) family planning methods; d) Assisted reproductive technologies and e) the promotion of healthy reproductive lifestyles.

Results

All textbooks presented inaccurate information in the areas studied. Two hundred and eighty one quotes were identified that facilitated an incomplete perception of sexuality or enabled risky behavior. An average of 12.6 incorrect messages was identified in each textbook.

Conclusions

The textbooks examined are neither appropriate nor comprehensive enough for adolescent education on issues of sexuality. Results suggest a need for alternative textbooks based on better scientific evidence. It is essential that textbooks empower adolescents to make healthy decisions through the promotion of useful life skills that provide a more integrated concept of sexuality. In any case, there is a need for approaches to sexual education to integrate values commonly held by parents of the youth that use such texts.

Key words: Sexual education, condoms, AIDS, sexually transmitted infections, multiple sexual partners

INTRODUCTION

There is great concern amongst political, health, and educational authorities in regard to teenage sexuality and associated adverse reproductive outcomes. Much contemporary research reveals that, in addition to an increase in condom use, there has also been an increase of heterosexual transmission of AIDS and other sexually transmitted infections (STI). These outcomes have become particularly prevalent among youth aged 15 to 24 years [1-5]. In Spain, the age of first sexual experience has gone down, while rates of unwanted teenage pregnancy are going up. The pregnancy rate of Spanish adolescents under 18 years of age has doubled over the last ten years [6,7]. Beginning sexual experimentation at an earlier age may lead to an increase in number of lifetime sexual partners, which in turn is associated with a higher risk of STI [3,8-11]. This has led to an increase in programs aimed at teenagers to promote healthy sexual behaviours.

A meta-analysis published in the *British Medical Journal* reviewed the effectiveness of sexual education programs whose objectives included delaying sexual activity, promoting better contraceptive use and reducing the rate of teen pregnancy. The authors reviewed studies from 22 publications, in addition to non-published data. Their conclusions affirmed that the sexual education policies established since 1970 have had little success in controlling these outcomes [12]. Another review shows that while sexual education programs are successful in changing sexual behaviour like increasing condom or contraceptive use among youth, they do not significantly reduce STI and unintended pregnancy rates [13].

While several causes for the high prevalence of adverse sexual outcomes are possible, the lack of information does not seem to be the problem. Research shows that the majority of pregnant teenagers had seen a health care professional and been given

contraceptive information in the previous year [14]. Other studies suggest that although youth are now better informed on issues of contraceptive use, the prevalence of contraceptive failure remains paradoxically high [15-17].

The problem does not either appear to be related to difficulties in contraception accessibility. In the UK, the country with the highest teenage pregnancy rate in Europe, there are more pregnancies in areas where contraception is more widely distributed [18]. A Spanish national survey on youth and sexuality revealed that 81% of adolescents did not report having a problem with contraceptive availability [6]. While the idea that extensive distribution of contraception guarantees efficient birth control is widely accepted, the reality is more complex. For example, a study conducted in France indicates that the majority of the reported unplanned pregnancies occurred among women using a birth control method [19]. Several Spanish studies indicate that, among adolescents, the most common reasons for requesting the emergency contraceptive pill were condom rupture and vaginal retention/slippage of the condom [20,21]. In addition, teenagers who had a pregnancy ending in termination were more likely to have used a birth control method in the past, including the emergency contraceptive pill [22-25].

Also, developing countries with more access to condoms and information about their use are the same countries that are now facing more problems with AIDS [26]. It is possible that addressing certain problematic health issues without adapting the message to the intended target age group may result in behaviour that directly contradicts the intended message.

Epidemiological studies show that certain attitudes and beliefs about sexuality can lead to adverse reproductive outcomes [27,28]. Hence, sexual education in school plays an essential role in teaching youth certain beneficial lifestyles that are in accordance with societal expectations. However, it has been documented in

experimental studies that the promotion of condom use can also indirectly encourage adverse sexual behaviour [29,30]. Therefore, the content of these sexual education programs are of utmost importance and discussion of the issues should continue until decrease in teen pregnancy rates and STI infection occurs.

In middle and high school, textbooks are the most common educational resource, making them the backbone of the official curriculum and, to a greater extent, of the culture transmitted in the classroom [31]. In Spanish schools, sexual education is a subject that can be explained in any time by any teacher. Sometimes, there are specific courses about sexuality given by a school counsellor and aimed at parents and/or pupils. But, the majority of the contents about sexuality are explained in Biology classes.

Having adequate knowledge to distinguish between healthy and risky behaviour is the first step to choosing healthy behaviour [27]. We therefore analysed chapters from textbooks that deal with human reproduction and sexuality in order to evaluate if the information within these chapters is complete and promote healthy reproductive choices.

Methods

The sample consisted of the textbooks of 12 publishers used in Spanish secondary education (14-15 year old students) in the subject of Biology (Table 1).

These publishers are the most widely distributed textbooks in Spanish public and private schools. A study published in 2001 stated that the textbooks by Santillana, Anaya, SM (it has two different textbooks), Vicens-Vives and Ecir comprise at least 80% of the Spanish publishing market of compulsory secondary education textbooks [32]. This is probably a very conservative figure because we revised six more textbooks aside from the ones cited above and the texts we have not reviewed cover much smaller markets each. We decided not to study these other texts with very small markets each

for efficiency purposes. The other textbooks under analysis include those published by Bruño, Edebé, Edelvives, Editex, Everest and Oxford.

The analysis of textbook content was conducted through a comparison of the textbooks' content with scientific evidence published over the last 6 years in scientific journals. One of the authors (IGU) performed the evaluation using a previously designed checklist. Blinding of the Editors of the texts being reviewed was not feasible. The following criteria were under examination: a) Condom effectiveness in the prevention of pregnancy and STI transmission; b) STI consequences, prevention, and treatment; c) Family planning methods; d) Assisted reproductive technologies and abortion. Assisted reproductive technologies are technologies to increase fertility and include in vitro fertilisation, intra cytoplasmatic sperm injection, the transfer of frozen embryos and oocyte donation; e) Promotion of healthy reproductive lifestyles.

The books containing statements supported by published scientific evidence received a positive score; whereas those that included at least one incorrect, confusing or incomplete information, thus implying invalid or obsolete knowledge, received a negative score. The absence of discussion concerning specific issues related to sexuality was scored as "zero" (0).

We did not seek moral and or ethical approval of any of the scientific information being evaluated, as this was not our goal.

Results

The results of these analyses indicate that all the textbooks reviewed contained some information that contradicts scientific data published in the peer-reviewed journals cited in the reference section of this paper. At least 151 statements were identified as providing an incomplete picture of human sexuality, while also failing to discourage multiple partners among teenagers. The average number of misleading statements found

in each textbook was 12.6. Publishers Vicens-Vives, Bruño, Editex, Oxford and Ecir surpassed this average, whereas Edebé had the least amount of such statements (Figure 1).

A categorization of the statements is as follows: 31 (20.5%) statements lacked scientific accuracy concerning the effectiveness of condoms in the prevention of pregnancy and STI transmission; 18 (11.9%) statements did not provide adequate knowledge of STI or of their prevention strategies; 40 (26.5%) statements were misleading in regard to various family planning methods; 19 (12.6%) statements were inaccurate in assisted reproductive technologies and abortion; and 43 (28.5%) statements conveyed unhealthy reproductive lifestyle choices (Table 2). As mentioned in the methods section we remind the reader that a negative sign in table 2 means that at least one incorrect statement was found and a “zero” grading identifies aspects that were not discussed at all in a particular book. The most significant findings related to each issue are summarized below.

Effectiveness of condoms to prevent pregnancy and STI

Ninety-two percent of the textbooks examined do not reference the discrepancy between the theoretical effectiveness of condoms and the decrease in this effectiveness due to user-related errors. Thirty-one statements affirm simply that condoms are “safe to avoid STI and unplanned pregnancies”. Each textbook contained one or more similar statement. Other statements assert that condoms avoid pregnancy with a “high effectiveness” (Santillana, p. 137), a “very high effectiveness” (Vicens-Vives 109), and that condom use is “98% effective” (Anaya, p.115), or the “safest barrier” (Bruño, p.217), when in fact the pregnancy failure rate is 15% [33].

Textbooks can also be misleading with the implication that “condoms avoid STI” (Oxford, p.191). They include statements affirming that “the use of condoms is

fundamental to avoid transmission” (Everest, p.188), or that they are “an excellent means of protection from infection” (SM-Darwin, p.137), “the best”, “the most efficient” or “the only method” that protects from infections (Anaya, p.98, 99 and 115; Edebé, p.165 and 166; SM-Ecosfera, p.138), when this is not necessarily the case.

Consequences of STI, STI prevention and treatment

In 50% of the textbooks, many inaccuracies were detected in the discussion of AIDS treatment and the consequences of STI. Eighty three percent of the texts analyzed do not mention Chlamydia, and 58% omit mentioning the Human Papiloma Virus (HPV). Just one textbook (Edebé) presents abstinence, mutual fidelity, and the avoidance of multiple sexual partners as efficient alternatives in the prevention of STI.

One textbook states that AIDS “is the most difficult sexually transmitted disease to cure” (Edelvives, p. 107), when it is, in fact, incurable. Another states that “some treatments have been developed and help patients have an almost normal life” (Santillana, p.130), without cautioning that this is not necessarily the norm and thus what readers have to expect for their personal case if infected. A third book indicates that “currently, all the STI, with the exception of AIDS, have effective treatments, as they are treated with antibiotics” (SM-Ecosfera, p.138).

Family planning methods

All the books examined lack necessary information on the side effects of many contraceptive methods. Current knowledge about fertility indicators is absent from 83% of the texts, as is information about fertility awareness methods. Natural Family Planning (NFP) is systematically missing or considered obsolete in all of the chapters.

Publishers almost unanimously indicate that NFP has a “very low effectiveness” (Santillana, p.137), “a high number of failures” (Ecir, p.122), and is “absolutely not advisable” (Vicens-Vives, p.108). One of the texts does not mention NFP as a viable

birth control option (Anaya), while others give confusing and incomplete information (Bruño, Edebé, SM-Ecosfera, SM-Darwin). One textbook advises against NFP as it “requires a great knowledge of your body” (Editex, p.184).

In addition, basic information explaining female fertility was found to be inadequate. Only 17% of the textbooks explain the changes in basal body temperature and cervical secretions that occur during the menstruation cycle. The protective role of the secretions of Cowper glands, which balance the acidity of the urethra during male ejaculation, is also not discussed in detail. Further, little attention is paid to the possible presence of sperm in this secretion, which can occur even when the male does not actually ejaculate.

Assisted reproductive technologies

Textbooks in Spain include information about “assisted reproductive technologies”. In 75% of them, there was no information referencing the social and medical consequences associated with these technologies. The remaining 25% simply discussed the method in terms of its legality with statements such as “these are regulated by law” (SM-Ecosfera, p.137). Assisted reproductive technologies are said to be “simple and generally harmless methods” (Bruño, p.208) whereby “there is hardly any technical obstacle to prevent a couple from having a baby” (Ecir, p.129).

Direct references to abortion are avoided in 58% of the textbooks, while the remaining 42% justify abortion under certain circumstances. For example, when teenagers’ “great expectancies (such as education, their professional outlook or sports careers) could be shattered and turn them into frustrated persons” (Bruño, p.214). None of the textbooks raise the question of what responsibility, if any, the male should take in the situation, thus holding the female solely accountable for the consequences of her actions.

Promotion of healthy reproductive lifestyles

The majority of the textbooks poorly address and promote healthy sexual behaviours. The most severe inadequacies include a lack of critical discussions concerning various sexual behaviours (42%), and the affirmation that all behaviours are equally healthy (the remaining 58%). Sixty-seven percent of the textbooks include claims or suggest activities under the assumption that teenage sexual activity is the norm. For example, some statements only recommend condom use when “having a sporadic sexual intercourse or with an unknown person” (Oxford, p.193), as well as avoiding promiscuous behaviour with “too many partners” (Anaya, p.99). Ninety-two percent of the textbooks make no clear statements promoting a delay of first sexual activity in youth, nor of the benefits of avoiding multiple (concurrent or sequential) sexual partners.

Discussion

Effectiveness of condoms to prevent pregnancies and STI

Just one publisher (Ecir) explains the difference between the theoretical effectiveness of condoms and other contraceptive methods and their actual effectiveness due to user-related failures.

The messages of these textbooks tend to suggest a high degree of confidence in condom effectiveness, while also spreading an unrealistically low awareness that sexual activity can have serious consequences. Thus, teenagers are indirectly rushed into engaging in premature sexual behaviour that seems safe and problem-free, based on the content of their sexual education textbooks. This kind of information has been proven to increase multiple sexual partners and its subsequent public health problems [29,30]. Some authors have warned about the existing association between condom use and prevalence of STI, which is particularly prevalent among teenagers, due to the fact that

condom failure is systematically bound to be more frequent when used by someone with little experience [34,35]. All “safe sex” messages should be replaced by “safer sex” messages because they correspond more to reality [36].

Scientifically, condoms are considered “moderately effective” to prevent pregnancy [33], while health authorities warn that condoms offer a poor protection against the transmission of three of the most common STI: Chlamydia, herpes, and the Human Papillomavirus (HPV) [11,37,38]. Research shows that transmission of the HPV is primarily a skin-skin transmission [39,40]. HPV has become one of the most troubling STI in the USA, as it is considered a necessary cause of cervical cancer [41]. A recent study shows that 37% of women who used condoms in 100% of intercourse, still end up getting infected by HPV [42]. Even when condoms are promoted, youth should constantly be advised that the safest way to prevent STI, including HPV, is through abstinence from sexual contact or maintaining a steady relationship [43,44].

In practical terms, the communication of the alternative message of abstinence could positively empower youth to delay beginning their sexual relations. Teenagers should be able to acquire the life skills necessary for love and commitment, thereby making them better equipped to make the decision of when to have sexual relations and to have the appropriate knowledge and awareness of the possible consequences. A recent international expert consensus in *The Lancet* clearly states that, when targeting young people: “for those who have not started sexual activity the first priority should be to encourage abstinence or delay of sexual onset, hence emphasising risk avoidance as the best way to prevent HIV and other STI as well as unwanted pregnancies”. The consensus further affirms that: “after sexual debut, returning to abstinence or being mutually faithful with an uninfected partner are the most effective ways of avoiding infection” [44]. This prevention strategy is called the ABC approach (**A**bstain, **B**e

faithful/reduce partners, use Condoms) and its aids prevention effectiveness has been reported to be similar to discovering an AIDS vaccine with an 80% effectiveness [45]. So far, no population based aids prevention program exclusively centred on the promotion of condoms has succeeded in decreasing aids incidence. The only countries that have lowered their aids incidence have promoted the A and B components of the ABC approach [46].

It is highly advisable for publishers to incorporate these guidelines in order to bring about change in the rates of pregnancy and STI among teenagers. Furthermore, textbooks should contain the caveat that the theoretical risk of HIV infection, albeit small with consistent and proper condom use, is cumulative and increases with time, as well as with every new partner and sexual contact [46]. While some argue that these recommendations are not “realistic,” there is international epidemiological evidence that documents the success of such prevention programs [47-50]. In addition, no proper informed choice is possible without informing students that, if sexual activity takes place in spite of this message, condoms are associated with an 85% effectiveness to prevent unexpected pregnancies and an 80% relative reduction of the probability of infection from STI, but can never eliminate these risks [37].

Consequences of STI; STI prevention and treatment

The problem with the identified statements concerning the prevention of AIDS and other STI is that the textbooks do not discuss STI with the appropriate sense of urgency that they deserve. In direct contradiction to what is taken as fact in these textbooks, AIDS and certain STI do not currently have a cure. Moreover, because some STI are asymptomatic, their diagnosis and treatment may be delayed for months or even years.

The consequences of this delay in diagnosis and lack of STI treatment can be serious. Untreated STI are associated with a high risk of chronic pelvic inflammatory disease, ectopic pregnancy, infertility (mainly due to Chlamydia), morbidity and child mortality (due to herpes), and cervical cancer (due to HPV) [40]. These facts are not presented in the textbooks and their absence is a great disservice to its audience who may be engaging in sexual activity, unaware of the possibility of such devastating consequences.

Family planning methods

Each textbook presented either a lack of relevant information or inaccurate data about the mechanisms and possible side effects of certain contraceptives. For example, 92% of the books classified some hormonal family planning methods that can have mechanisms of action at stages between fertilization and implantation as “contraceptives”. This terminology is not entirely precise because fertilization is not avoided in this case and raises the question of whether one is being properly informed of the true nature of such methods [51,52]. Scientifically, such methods should be called “post-conception” methods or methods with post-fertilization effects, and women should be aware of such subtleties. One of the textbooks claims that the day-after pill “is not a contraceptive method, but a method for emergency situations” (Bruño, p.215), while proceeding to include it in a summary chart of “contraceptives”. The same goes for the Intrauterine Devices (IUD), as scientific literature has described its post-fertilization effects [53]. Researchers in the field of family planning argue that the decision of what type of contraception to use cannot be made without substantial accurate knowledge about the possible post-fertilization effects that are sometimes involved [54].

While several textbooks claimed that certain fertility awareness methods were obsolete or lacking information and difficult to learn, the World Health Organization published a study which showed that illiterate women were able to successfully interpret their own fertility and use NFP [55]. Furthermore, the effectiveness of NFP has been documented in multicenter studies. Modern NFP, such as the symptothermal method, is an effective and side effect-free alternative that should have its proper place in these textbooks [56].

The lack of explanation concerning fertility indicators and Cowper gland secretions can result in unwanted consequences such as pregnancy. The fact that genital contact without penetration, petting or withdrawal may lead to pregnancy due to the presence of sperm in pre-ejaculatory secretion is crucial knowledge for these teenagers and should therefore be included in these textbooks.

Assisted reproductive technologies and abortion

The overwhelmingly favourable information concerning reproductive technologies is in direct contrast with research that proves otherwise. For instance, the rate of serious congenital malformations in children conceived by in vitro fertilisation (IVF) and by intracytoplasmic sperm injection (ICSI) is double that of naturally conceived pregnancies [57,58]. Furthermore, the IVF and ICSI failure rates average 75%, while personal and monetary costs are substantial [59,60].

The textbooks under study do not promote alternative behaviours to prevent teenage pregnancy. Perhaps even more critical is the absence of discussion relating to the social and psychological problems that are prevalent among teenagers who choose to have an abortion [61]. The consequences of early parenthood are not discussed either.

Promotion of healthy lifestyles

Several studies show that early sexual activity is a risk factor for AIDS and other STI [62]. Sexual education programmes that give information about abstinence, or the delay of sexual onset, and about condoms should in our view make a special emphasis on abstinence and character education when speaking to youth. Such programs that mainly promote abstinence could be successful in the prevention of teenage pregnancy [63]. They are called “abstinence centred” programmes as opposed to “abstinence only” programmes or other programmes that convey the information on abstinence and condoms without placing any emphasis on either. Finally, some programmes do not mention abstinence as a realistic choice. A recent study discussing sexual behaviours that can be considered causes of a health burden in the United States estimated the proportion of deaths and disability that can be attributed to sexual behaviour (1 in 100 US deaths). This study suggests the “ABC” approach has a role in reducing this burden [64].

Statements recommending condom use with “sporadic sexual intercourse or with an unknown person” or recommending youth not to be “too promiscuous” sends a clear message that having sporadic sexual relations with strangers or with a “moderate degree” of promiscuity, is perfectly acceptable as long as this behaviour is accompanied by diligent condom use. This idea contradicts scientific evidence that shows a correlation between a decrease in number of sexual partners with a decrease of the AIDS epidemic irrespective of the condom use prevalence in some parts of the world [62].

Most publishers make the problematic assumption that the majority of 14-15 year olds are sexually active. Data from the Spanish National Institute of Statistics shows that no more than 29,8% (approximately 11,4% of women and 18,4% of men) of

adults aged 18 to 29 in 2004 confirmed that their first sexual experience occurred before the age of 16 [7]. These textbooks are portraying teenage sexual activity in a way that is not supported by epidemiological data. Respect and tolerance towards specific views or opinions about sexuality should be compatible with giving objective advice concerning information that is in accordance with epidemiological research, therefore leading to healthier reproductive choices. These textbooks should outline and promote beneficial sexual behaviours in contrast to those that might be more risky. For instance, there is scientific evidence showing that family structures strongly influence sexual and other risky teenage behaviours [65,66]. In order to help youth achieve an ideal family environment in their lives, schools should promote attitudes and motivations to enable empowerment and self control as well as behaviour change when necessary. Being successful in founding a healthy family environment also depends on these life skills. Furthermore, the prevention of most contemporary public health problems such as tobacco, traffic accidents, obesity, diabetes, etc. depends, to a great extent, on whether one is able to control and modify his/her behaviour.

This study suggests that the textbooks most commonly used in Spanish school systems lack scientific accuracy that is crucial to matters concerning teenage reproductive health issues. These textbooks are neither a sufficient reference, nor an adequate teaching tool for teachers to educate 14-15 year old students on issues of sexuality. One could argue that these inaccuracies could be due to the fact that there has been new knowledge available since last editing in 2002. But, information about issues checked in our review, such as HPV and other STI or about condom effectiveness, has been available before 2002. In any case, publishers should update all the relevant information concerned to youth health.

These books should accurately value certain sexual behaviours to promote healthier reproductive choices. In order to help teenagers make more informed decisions about when to begin sexual activity, it is necessary that they receive all the relevant information to make that decision. By providing information that outlines the benefits of abstinence or the delay of sexual experience, it may be possible to achieve an increase in the average age of sexual experimentation among teenagers. The lack of explicit positive messages favouring abstinence and mutual fidelity among couples may lead teenagers to believe that there is no alternative to having sex at a young age and that the appropriate response to sexual feelings is to act on them, even when impulsive.

Limitations and strengths

This study has some limitations that have to be taken into account by the reader. The scoring system we used has its limits because we intended to give a numerical significance to sometimes qualitative data. However, we tried to evaluate items using clear-cut criteria. For instance, we evaluated the absence or presence of information or the presence of clearly wrong information, etc. We tried not to engage in evaluating aspects that could be more difficult to assess or that could have different interpretations. This is what could be reasonably done with the resources available.

One of the authors (IGU) performed the evaluation. Blinding of the editors publishing a given book evaluated was not feasible because editors have well known editorial styles that can be identified upon reading any chapter. Furthermore, there was no double check of the review (no inter-coder reliability) and no quantitative evaluation or measure of the reliability of this review. However, to avoid forgetting aspects that had to be reviewed from one text to another and/or to minimise a biased and/or differential evaluation, a checklist of the criteria and aspects to be looked for in the evaluation was previously designed. This was done with the help of the education

department of our university and without having previously read the textbooks to be evaluated.

The examples cited in the results and discussion section should not necessarily be considered as a reflection of the proportion and degree of seriousness of the mistakes in the books reviewed. We did not have the objective of describing errors in a representative manner. We rather intended to pin point that books indeed have serious errors and one such error in one text book is in our opinion important enough to draw the attention of the public. For example, it is serious enough to know that a book affirms that “all STI’s have a cure” because this could have serious health consequences for the youth that read such statements.

Our study is an invitation to consider the overall integration of the different people and groups involved in the education process of sexual issues for young people: parents, teachers, textbooks authors and editors, as well as educational and health authorities. The clear contrast between scientific evidence and the information imparted in the majority of these textbooks is worrisome from the public health standpoint and emphasises the importance of access to accurate and relevant information. Without accessibility to reliable information that details issues related to sexual activity and its consequences, it is impossible to have freedom of choice in the decision making of issues related to sexuality.

We encourage researchers to perform studies similar to ours as they stimulate the debate among editors, teachers and parents.

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Competing interests

The authors declare that they have no competing interests.

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