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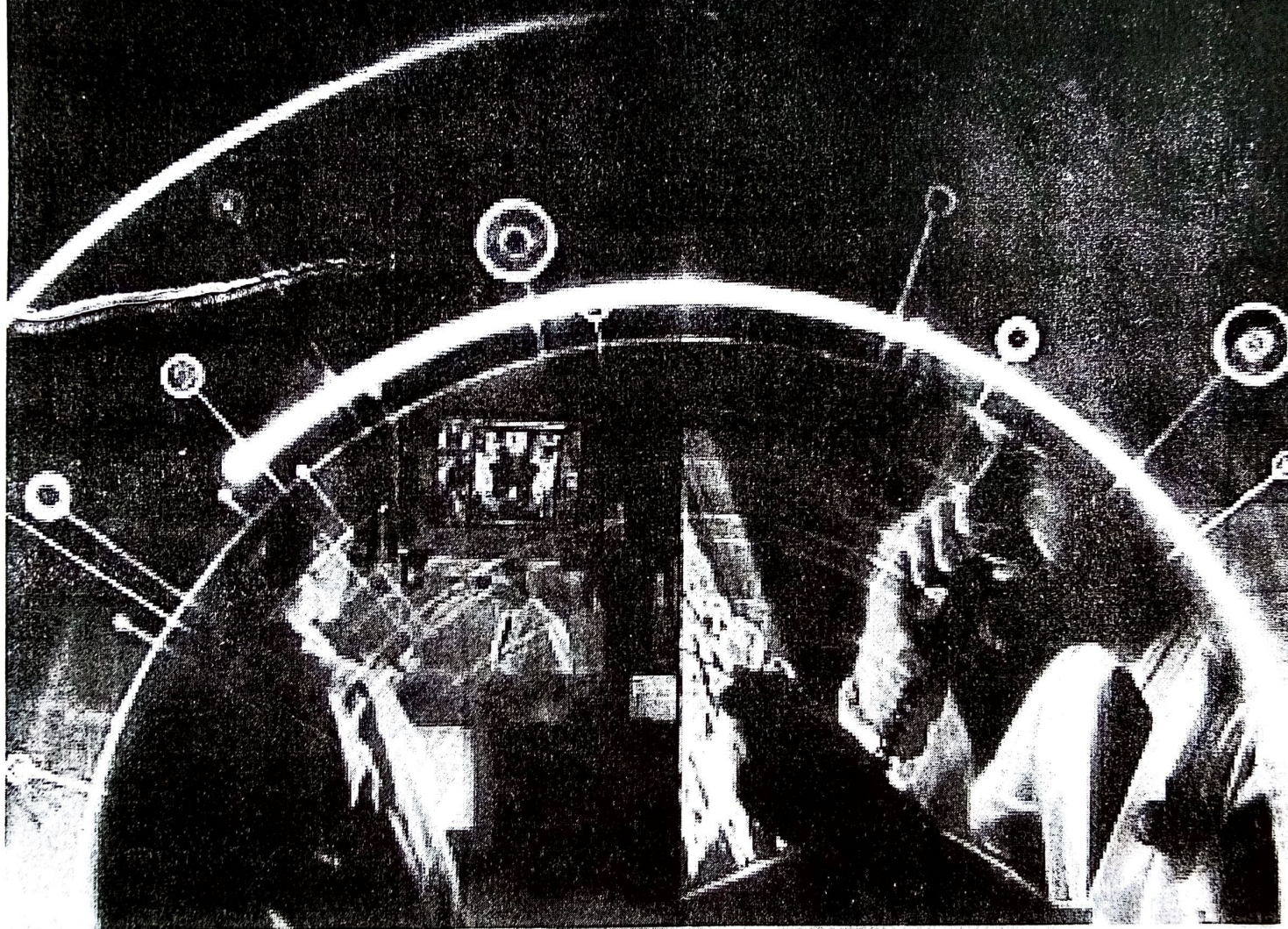
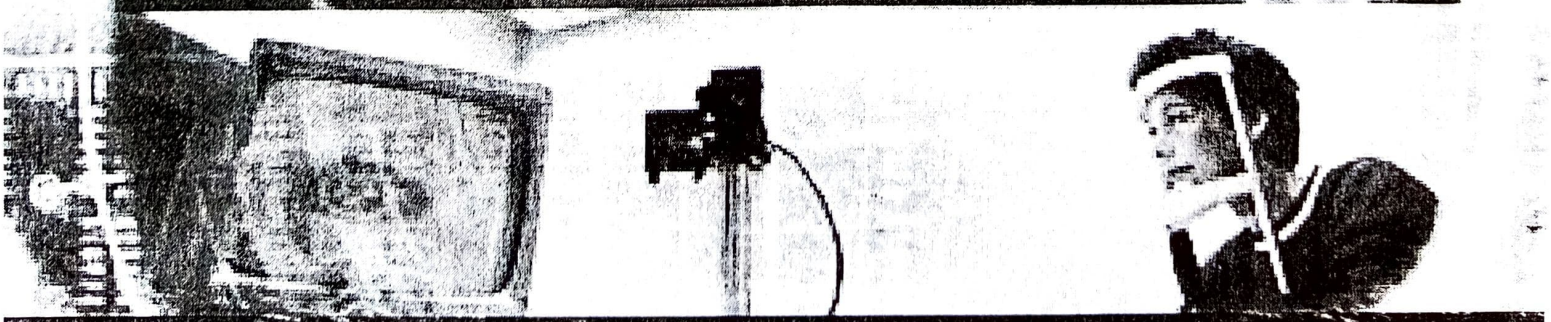
# Telemedicine and e-Health





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# Original Research

## Domestic and Peer Violence in Secondary School Among Adolescents: Can Telemedicine Help?

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## Abstract

*Domestic and peer violence in Macedonia is similar to other developed nations. It is present among adolescents and their families. A study was conducted on 664 secondary school students throughout Macedonia. The results indicated that 11.2% male and 16.54% female students often face different kinds of family violence. Peer violence of different forms is marked as "often" in 8.04% male respondents and 5.63% female respondents. One of possibilities in preventing this negative phenomenon is the application of telemedicine. There is a growing body of evidence that the use of telemedicine offers a good tool for mental healthcare in underserved communities, and that these services are as effective as face-to-face work with adolescents. By building an effective telemedicine network in Macedonia, both victims (adolescents) and their parents could be given a chance to contact proper institutions for help with more confidence and less stress.*

**Key words:** *telemedicine, adolescents, family violence, peer violence*

## Introduction

Violence against adolescents is not a new phenomenon, nor can it be explained in a simple manner. Violence has always existed in human society and has often been directed at those less capable of coping with it. One of the most common targets of violence is the weakest: women, children, and elderly. No wonder that society, through the centuries and in different civilizations, have tried to protect these most vulnerable groups with different norms, including moral, ethical, or even legal. In the explanation of violence and abuse of children and adolescents, most acceptable is the so-called Ecological Model, which explains the phenomenon as interaction of several factors (circles of interaction).[1] According to this model, risk factors for violence and abuse of children and adolescents were divided into four levels:

1. Individual level: personal history and biological characteristics of the person
2. Relationships level: relationships with family, friends, intimate partners, and/or peers;
3. Community level: relations with other people at work and school, with neighbors, and with other social groups
4. Society level: conditions that support or prevent violence.

All these factors can influence how individuals behave and increase the likelihood of becoming a victim or cause of violence.[1–12]

Violence of adolescents is a phenomenon that transcends the boundaries of nations regardless of their status, developing or developed. The 2002 Capital Study of the United Nations indicates that violence against children occurs in every state and touches on all social, cultural, religious, and ethnic groups.[1]

In the Balkan's region, countries like Macedonia have faced many political, social, and economic changes during last several decades. Children from these countries have been exposed to wars, waves of displacement (outside and inside), loss of relatives, and many other difficulties. This contributes to a greater likelihood of adolescents witnessing violence and become subjected to violences.[5,6] A 2001 UNICEF study, which include interviewing 15,200 children and adolescents in 35 countries in Europe and Central Asia, showed that 59% of them experienced aggressive behavior or violence in their own family. Of these children, 61% were residents of Eastern Europe and Central Asia, whereas 54% of them lived in Western Europe. Another study conducted by UNICEF and the organization Save the Children (2004) reported that 33.8% of children and adolescents included in the study claimed that they know one to three kids who have been subjected to violence in their families.[6–18]

Use of physical force and bullying are also common among young people. Almost all 13-year-olds have been subjected to some form intimidation at least once. Violence among youth affects bullies, victims, and observers. This type of violence can be one step in the continuum of aggressive behavior combining the use of power and aggression. Nonfatal attacks include significantly fewer attacks with firearms and more use of fists, feet, knives, and bats. During fatal injuries, firearms are used in almost all cases. Use of alcohol is an important factor that could prompt violence. According to the State

Statistical Office of the Republic of Macedonia, the number of murders among young people aged 15–29 years increased from 8 in 1995 to 16 in 2004 (of which 14 are male and 2 are female). Since 2000, mortality from homicide among youth in Macedonia is lower than Bulgaria, Serbia, and Montenegro but is higher than Slovenia and Greece.

As self-injury is concerned, young people constitute one-third of the hospital-treated population for self-harm. According to a 2004 State Statistical Office report, 27% boys and 16.9% girls of the those aged 15, at least once during the last few months, have been in the role of perpetrator and 24.6% boys and 21.5% girls of same age were victims of violence at least once during the last few months.[7–19]

It seems realistic to expect that these figures are much higher in the general population, taking into account the widespread belief (in the traditional cultures of the Balkan countries) that only the family is responsible for the welfare and living conditions of the child. According to this understanding is that categories like "neglect" or "abuse" or "violence" of the child should remain "in the family," private matter "without being reported to the appropriate authorities."[6]

### TELEMEDICINE AS A TOOL

How to penetrate these walls of conservativism of adults versus the need to speak up of adolescents when domestic and/or school violence is concerned? How can telemedicine help?

Psychiatric consultation using telepsychiatry is different from the traditional medical model of psychiatric treatment. Teleclinics create a new clinic team involving a coordinator who participates directly in the clinics and an off-site local primary care doctor.[20]

The American Telemedicine Association defines it as the use of medical information exchanged from one site to another via electronic communication for the health and education of the patient or practitioner and for the purpose of improving patient care.[21]

One of the most popular applications of telemedicine is psychiatry, or telepsychiatry. Technological advances have made interactive video conferencing with adults comparable to face-to-face visits in eliciting a psychiatric history, conducting a mental status examination, and making reliable diagnoses. A physical examination is often not needed, or it can be easily arranged by the local primary care physician. Preliminary studies also suggest the effectiveness of psychotherapy using telepsychiatry, and numerous studies have documented high acceptance of telepsychiatry by both patients and providers.[22]

Telemedicine clinics require greater parent involvement and education. They require greater overall structure for success. The rural primary care doctors enjoy the opportunity to broaden their ability to use psychiatric medications and to see their patients improve. The clinics provide an excellent opportunity for psychiatric training. Because of the lack of adequate diagnosis before consultation, cases can have added complexity. From our telepsychiatry chart review, it was found that more than half of the new patients seen had incorrect diagnoses and medications, but the conditions of these patients improved after they were seen in our clinic.[20]

By default, adolescents are more familiar to all informatics technologies (including telemedicine) and there is a great chance that this kind of technique would be more successful in establishing (mediating) contact between an adolescent–victim of violence and a helper (or supportive staff: teacher, school psychologist, or all kinds of health professionals).

Expertise in child abuse and neglect and the interdisciplinary communication that often must take place for an adequate child-maltreatment investigation present challenges that telemedicine could help to address. One pilot study on the use of teleconference facilities in the evaluation of child abuse in Florida showed that teleconferencing was acceptable to patients.[22]

On the other hand, adults (possible perpetrators or victim's parents) would be more comfortable to talk to TV (telemedicine equipment) rather than real person (supportive staff): having in hand the control button of telemedicine equipment might provide a level of comfort to him/her feeling of control over situation–they can stop the process whenever they want.

Case studies with children have suggested positive effects with treatment over interactive videoconference (VC) for oppositional defiant disorder, family conflict, and externalizing behaviors. Families and clinicians are overwhelmingly satisfied with telemental health services in the United States and across the world.[23]

Telemedicine works! There are different telemedicine systems in function in the United States and Europe. In Macedonia's neighborhood (Albania and Kosova), telemedicine centers give their medical and educational help both to patients (adolescents among them) and medical staff.[24,25]

Having this in mind, the goals of this article are

- to determine the presence and frequency of domestic violence on adolescents in the experimental group;
- to determine the frequency of school (peer) violence among adolescents in the experimental group; and
- to offer model of telemedicine application in prevention of violence among adolescents.

## Materials and Methods

This study is of cross-section type. The experimental group consists of secondary school students (adolescents) aged 18–19 years. Having regard to the total number of students in secondary schools in Macedonia (school year 2008/09), which, according to data obtained from the Ministry of Education, is 25,841 students, the size of the sample (according to epidemiological rules for such studies) should be little >2% of the experimental group, that is, $n=664$ students: 258 male students and 406 female students (for $p=0.05$; margin of error=4).

The study was conducted in the same period (March–May, 2010) in six high schools throughout the country: two schools in Skopje (one secondary vocational school and one high school, and one school in Gostivar, Struga, Bitola, and Shtip). Seven hundred questionnaires were given to subjects. Three of them exercised their right not to take part in this study: this option was presented to all participants before

Table 1. Exposure to Family Violence

| TYPE OF CHILDHOOD EXPOSURE | MALE | | FEMALE | |
|---|---|---|---|---|
| | NEVER (RARELY) | OFTEN | NEVER (RARELY) | OFTEN |
| Psychological abuse | | | | |
| Someone in your family hated you | 240 (93.02%) | 18 (6.98%) | 357 (87.93%) | 49 (12.07%) |
| Parents wished you've never been born | 252 (97.7%) | 6 (2.33%) | 362 (89.16%) | 44 (10.84%) |
| Threaten to hit you or throw something at you | 210 (81.4%) | 48 (18.6%) | 326 (80.29%) | 80 (19.71%) |
| Swear at you, insulted you, or put you down | 207 (80.23%) | 51 (19.77%) | 215 (52.96%) | 191 (47.04%) |
| Physical abuse | | | | |
| Push, grab, or throw something at you | 250 (96.9%) | 8 (3.1%) | 391 (96.3%) | 15 (3.7%) |
| Hit you hard that you had marks or were injured | 255 (98.8 4%) | 3 (1.16%) | 392 (96.55%) | 14 (3.45%) |
| Made you afraid that you might be physically hurt | 239 (92.63%) | 19 (7.37%) | 369 (90.89%) | 37 (9.11%) |
| Disciplining children by spanking | | | | |
| How often were you spanked | 180 (69.77%) | 78 (30.23%) | 299 (73.64%) | 107 (26.36%) |

giving the questionnaires. All questionnaires were classified according to criteria defined before the start of the study, so when all questionnaires that do not meet the criteria were eliminated, totally 664 questionnaires were submitted to analysis. This study was approved by the Macedonian Ministry of Education.

Sex, national, and socioeconomic structure of the experimental group was correspondent to a same structure of the general population of Macedonia.

Data were collected with Adverse Childhood Experience questionnaire.[26] It consists of 62 questions and subquestions for male form, and 66 questions and subquestions for female form. The questionnaires for adolescents were completed in school, with assistance and under surveillance of the expert examiner (psychologist and psychiatrist) who is familiar with the techniques of such examinations. Discretion of the collection of such data was provided with the application of the questionnaire in small groups so that participants sit far enough from each other to protect their data. Questionnaires coding process, which protects the identity of respondents and the data, was conducted on the basis of previously established procedure.

Participants' needs such as conversation (emotional debriefing), professional assistance, and further guidance were met. For this option, the participants (especially young) were notified orally by the examiners (pollsters) and in written form (as part of the questionnaire).

Statistical data were processed in the Statistics for Windows software (Microsoft, Redmond, WA). For statistical analysis of the results, a special database in Statistics for Windows 7.0 and SPSS 13.0 software was constructed. For further processing, appropriate statistical methodologies were used. Statistical significance was determined on the level of $p<0.05$ and $p<0.01$.

## Results

Violence against children and adolescents has long been a taboo not only in our region but also in surrounding states. Stereotypes such as "the family knows what is best for the child" and "parents/guardians are always right," combined with "stick is out of Paradise," give fertile ground for the violence against children and adolescents. Therefore, it is not surprising that cases of violence against adolescents are reported only when the consequences are serious for the child: serious bodily injury and/or death. Nevertheless, it is clear to everyone that these cases are just "the tip of the iceberg" called violence. On the other hand, flows in legal system (specifically in this area) do not allow preventive approach to this issue.[9–13,21]

Results of our research regarding family violence and peer violence are shown in *Tables 1* and *2*.

## Discussion

Results are clear: both violence and child abuse and neglect are present in homes and in schools of Macedonia. Building a telemedicine network in Macedonia is being explored. A telemedicine network, aimed at helping students in elementary and secondary schools, has the capability of addressing the issues of violence.

Expertise in child abuse and neglect and the interdisciplinary communication that often must take place for an adequate child-maltreatment investigation present challenges that telemedicine could help to address. One pilot study on the use of teleconference facilities in the evaluation of child abuse in Florida showed that teleconferencing was acceptable to patients. No evaluation data were provided.[22]

Case studies with children have suggested positive effects with treatment over interactive VC for oppositional defiant disorder, family conflict, and externalizing behaviors. Families and clinicians

Table 2. Exposure to Peer Violence

| TYPE OF CHILDHOOD EXPOSURE | MALE | | FEMALE | |
|---|---|---|---|---|
| | NEVER (RARELY) | OFTEN | NEVER (RARELY) | OFTEN |
| Peer violence | | | | |
| Swear at you, insulted you, or put you down | 201 (77.9%) | 57 (22.1%) | 336 (82.76%) | 70 (17.24%) |
| Hit you hard that you had marks or were injured | 255 (98.84%) | 3 (1.16%) | 405 (99.75%) | 1 (0.257%) |
| Push, grab, or throw something at you | 247 (95.74%) | 11 (4.26%) | 396 (97.54%) | 10 (2.46%) |
| Made you afraid that you might be physically hurt | 246 (95.35%) | 12 (4.65%) | 383 (94.33%) | 23 (5.67%) |

are overwhelmingly satisfied with telemental health services in the United States and across the world.[23]

Some school systems are experimenting with telemedicine links to extend the range of services in school-based clinics and decrease absenteeism for illness or disease-management encounters.

Seven components critical for sustainability of this network could be highlighted.[20]

## TELEPSYCHIATRISTS AS COLLABORATIVE CONSULTANTS TO PRIMARY CARE RURAL DOCTORS

Hub site telepsychiatrists work as consultants and do not provide direct care. All treatment is local, including emergency treatment. The primary care doctor, or patient, is not present during the consultation but will implement treatment recommendations for medications and medical or laboratory tests. He or she may call the telepsychiatrist with any questions or concerns. The telepsychiatrist continues to consult with the patient virtually while actively monitoring progress in follow-up visits.

## CONSULTATION INPUT: MULTIDISCIPLINARY DATA PROVIDED FOR EACH CONSULTATION

The spoke site coordinator gathers critical information from multiple sources for all clinic visits, starting with the evaluation. Without this information including report cards, individual educational plans, laboratory tests, psychological testing, therapist reports, teacher progress notes, and symptom rating scales, the hub child psychiatrist will not have necessary data to evaluate progress.

## INTERACTIVE MULTIPLE PARTICIPANT CONSULTATION

This consultation often includes four or five people at both the hub and spoke sites, creating a large treatment team that collaborates with the parent. The clinic coordinator manages the spoke clinic and helps with on-site issues such as escalating behavior. In congruence with this, it was found that by hearing the process of the treatment team and creating a plan helps parents feel more in control and more comfortable with the telepsychiatrist's recommendations. The parents gain insight into the thought process behind decisions and become more informed about their child's treatment and problem.

## CONSULTATION OUTPATIENT: TREATMENT NETWORK

The telepsychiatrist usually recommends medical, psychopharmacological, behavioral, and psychological (for child and family) treatment, as well as school and developmental interventions for the child. The spoke site must coordinate with providers who can supply specific services and are willing to work with the clinic.

## TELECLINIC COORDINATOR WITH BOTH ADMINISTRATIVE AND CLINICAL ROLES

The spoke site telemedicine coordinator must have expertise with technology and clinic administration, participate in clinics, and coordinate follow-up care and triage issues that arise. Because of the limits in what the telepsychiatrist can see, the coordinator is the in-session eyes and ears, observing the patient and actively directing the psychiatrist to things he or she cannot observe directly.

## CLINIC SETUP

Clinics must occur in structured blocks of at least 2 h.

## EDUCATION: TRAINING OF PROFESSIONALS

Trainees can attend telepsychiatry sessions with less intrusion than families would experience in a face-to-face consultation. Trainees can

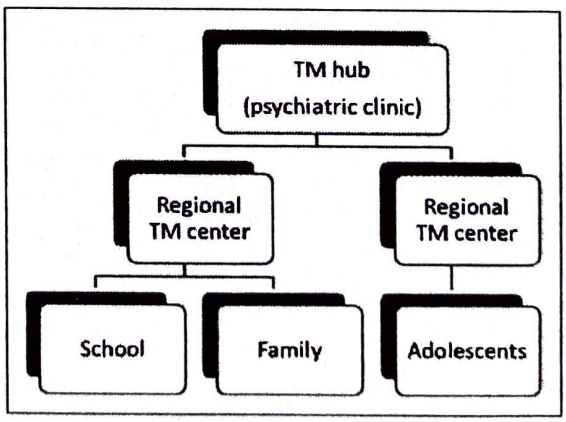


Fig. 1. Organizational scheme of future telemedicine network in Macedonia. TM, telemedicine.

participate easily and actively learn from direct rather than after-the-fact supervision. It should be stressed that presence of school psychologist and/or pedagogue is less in Macedonia. They could be first choice when recruiting telemedicine coordinators in schools.[20,22]

This kind of network already exists in Albania and Kosova, where several regional medical centers are linked into telemedicine network. They provide medical services to patients and educational services to medical students (through an electronic library), doctors, and other medical staff through telemedicine lectures.[25]

One of the main goals of the future telemedicine network in Macedonia is to expand current services that are provided, by networking schools and offering a possibilities for individuals (adolescents and their parents) to approach institutions that would help them deal with violence and abuse through a less embarrassing way and to overcome cultural restrains present in our society regarding family violence, abuse, and neglect of adolescents (*Fig. 1*).

## Conclusions

Violence, domestic and in schools, is there and it should be fought with all means. Present practice to deal with consequences of rather than with causes is not promising in the prevention and treatment of children subjected to violence. A good tool to do this could be the telemedicine network in elementary and secondary schools and building a vertical hierarchy through regional medical centers to telemedicine hub in the psychiatric clinic in Skopje.

With informatics technology advancing rapidly, it is becoming increasingly easy to establish some kind of computer- and Internet-based link between schools (or student's home) and specialized centers that deal with prevention and treatment of any kind of violence against children and/or adolescents.

Telemedicine is not a panacea, but it could be a very useful tool for dealing with many medical problems, specifically with long-acting and crippling problems as family and peer violence.

## Disclosure Statement

No competing financial interests exist.

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