Volume 5 / Number 1 / 2017 ISSN 2303-4092

Balkan Journal of Health Science

Volume 5 / Number 1 / 2017

Balkan Journal of Health Science

Address:
Sarajevo,
Bolnicka bb,
Bosnia and Herzegovina
E-mail: balkanjournal@yahoo.com
Web page: http://www.drunpp.ba/bjhs.html

Published by DRUNPP, Sarajevo
Volume 5 *Number 1, 2017*
ISSN *2303-4092*

Volume 5 / Number 1 / 2017

Balkan Journal of Health Science

Sadržaj / Table of Contents

The correlation between the mechanism of the peripheral nerve injury of the upper and lower extremities and indicated time and modality of reconstruction

Salihagic Sanela[1], Muftic Mirsad[2]

[1] Clinic for reconstructive and plastic surgery, Clnical University Center Sarajevo, Bosnia and Herzegovina,
[2] Faculty of Health Studies, University of Sarajevo, Bosnia and Herzegovina.

Abstract

Introduction: The peripheral nerve injuries of the upper and lower extremities are result of the influence of different mechanisms , with potentially diverse range of the nerve destruction, which significantly affects the time and modality of the peripheral nerve reconstruction. The combination of the nerve damage with lesions of the other anatomical structures often disables reconstruction immediately after injury. The consideration of each individual case, with evaluation of the motor and senzitive outage, determines the most optimal modality of the peripheral nerve reconstruction. The type of the peripheral nerve reparation has to be considered regarding possible benefit and succesfull rehabilitation.

Patients and methods: We have evaluated postoperative results of the peripheral nerve injuries of the upper and lower extremities in 60 cases treated on the Clinic for reconstructive and plastic surgery University Clinical Center Sarajevo during five-years period (2011.-2016) The analysis has been conducted using SPSS v13.0 program with the package for Medical Research.

Results: The correlation between the mechanism of the peripheral nerve injury and the indicated time of reconstruction has been evident in our research. Laeceration of the peripheral nerves have represented in the most cases the indication for the reconstruction within 3 months after injury (47 cases; 78.3%). Traction and contusion of the peripheral nerve have been related to postponed reconstructions (7 cases; 11.6%), due to the impossibility of the proper evaluation of the level of injury and the potential nerve scarification. The correlation between the time interval from moment of the injury to the the term of operation and the operative modality selection has also been evident. The peripheral nerve injuries have been treated by primary reparation within 6 months in the most cases (47 cases; 78.3%) comparing with nerve transplantantion which has been applied in 8 cases (13.3%) during first 6 months and in 5 cases (8.3%) after that period.

Conclusion: The mechanism of the peripheral nerve injuries has the infuence to the time and modality of reconstructive procedure

Key words: mechanism of injury, peripheral nerve, modality of reconstruction

Introduction

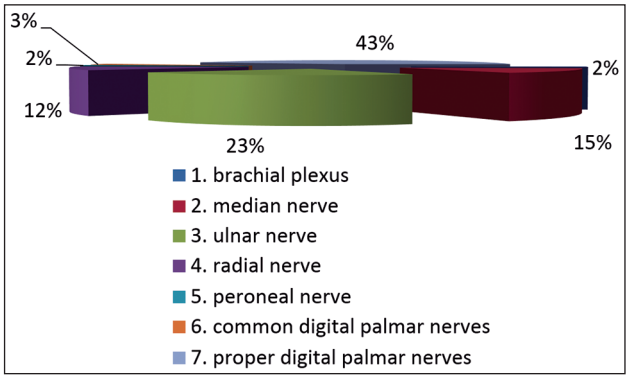
Peripheral nerve injuries represent an important segment of traumatology. Timely identification of peripheral nerve lesion, with testing of motor and sensory function, is guideline for the futher treatment. Unrecognized and inadequately treated peripheral nerve injury results in often severe functional sequelae and permanent disability. During the selection of the time and modality of peripheral nerve reconstruction, we have to consider some important factors, such as mechanisms of injury, level of the injury and associated injuries of the other anatomical structures. Peripheral nerve injuries are common in the setting of complex upper extremity trauma. When evaluating patients with significant limb trauma, it is critical to identify and manage the concomitant nerve injuries. Without restoration of motor and sensory function, the salvaged limb becomes an insensate, and often painful, inanimate prosthetic. Injury mechanism determines the appropriate evaluation and management strategy. An open and sharp transection nerve injury demands a very different approach from a closed crush or gunshot wound injury pattern. Defining the nerve injury

will also predict potential recovery of function. Understanding timing is critical to successfully treating peripheral nerve injuries. There are advantages and disadvantages to acute versus subacute surgery ([1]). Direct repair remains the current standard of care for the repair of peripheral nerve lacerations. In large nerve gaps, in which direct repair is not possible, grafting remains the most viable option Nerve scaffolds include autologous conduits, artificial nonbioabsorbable conduits, and bioabsorbable conduits and are options for repair of digital nerve gaps that are <3 cm in length. Experimental studies suggest that the use of allografts may be an option for repairing larger sensory nerve gaps without associated donor-site morbidity ([2]). Peripheral nerve repair with an initial motor nerve babysitter with 40 percent neurectomy of the donor nerve can achieve high efficacy in functional and structural recovery of the recipient system. Nerve babysitter by motor nerve with an epineural window was less effective ([3]). Although autografts are the gold standard for failed primary nerve repairs, they result in donor-site morbidity. Nerve conduits and decellularized allografts are a novel solution for improved functional outcomes and decreased donor-site morbidity ([4]). Current repair options for peripheral nerve injuries where tension-free gap closure is not possible include allograft, processed nerve allograft, and hollow tube conduit. Nerve allografts had significantly improved and more consistent functional sensory outcomes compared with hollow conduits ([5]). Patient age, mechanism of injury and associated vascular and soft tissue injuries strongly influence the extent of recovery of the injured nerve. These elements are of great importance and are the primary details collected in the clinical history. A detailed examination includes evaluation of pain and muscular strength and sensory testing in the territory of the injured nerve ([6]).

Patients and methods

We have evaluated the results of the operative treatment of peripheral nerve injuries in 60 cases, treated on the Clinic for reconstructive and plastic surgery, Univeristy Clinical Center for the period 2011- 2016. The results have been presented by charts and also have been shown textually thorough absolute number of cases and percentage. X-square test with Yates correction for small samples and Fischer`s exact test have been used for the testing of the statistical significance of the differences. The results of χ-square test with $p<0,05$ have been considered statistically significant. The analysis has been conducted using SPSS v13.0 program with the package for Medical Research.

Results

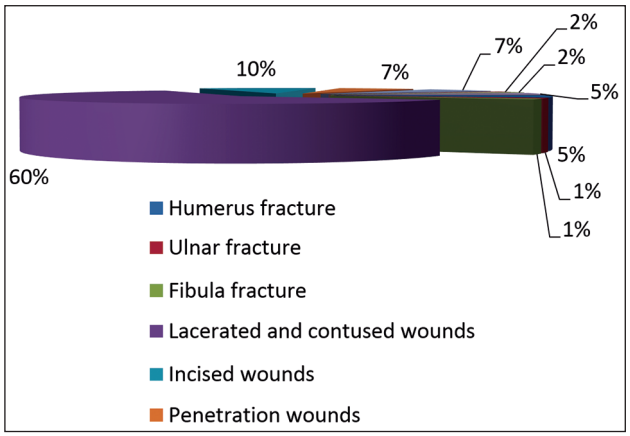


$\chi^2=52,371$; $p=0,0001$

Figure 1. The percentage distribution of the peripheral nerve injuries of the upper and the lower extremity

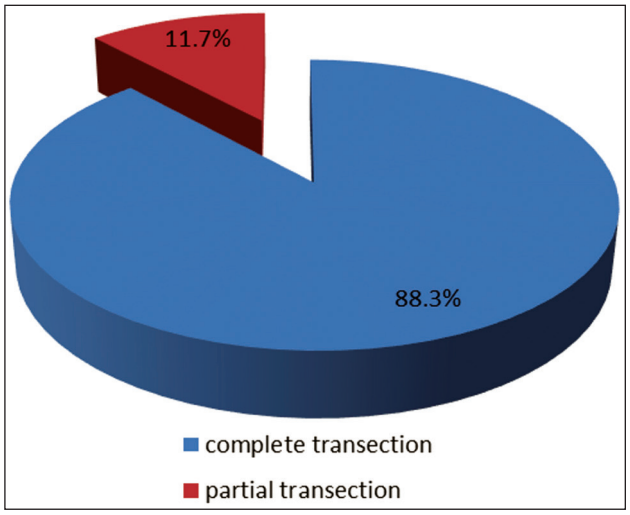
The high percentage of the palmar digital nerve injuries has been evaluated during the estimation of the 60 cases of the peripheral nerve injuries of the upper and lower extremities, according to the our results (26 cases; 43.3%) represented in the Figure 1. We had only 1 case of the plexus brachialis injury (1.7%), which is the most complex case from the prognostic standpoint. In our sample, the peripheral nerve injuries of the lower extremity have been related only to the peroneal nerve injury (1 case; 1.7%). There is a statistically significant deviation from the normal distribution ($p<0,05$).

The morphology of the tissue defects, caused by the different mechanisms and with resulting peripheral nerve injuries, has been very diverse (Figure 2). The analysis of the type of injury within the tested sample has showed that the laceration of the peripheral nerves had been the most common type of injury (36 cases; 60%). The incised wounds had been represented in the lesser percentage (6 cases; 10%). The other cases with peripheral injuries of the upper and lower extremities had a total participation of 18%, with statistically significant difference ($p<0,05$).



χ2=61,417; p=0,0001

Figure 2. The morphological characteristics of the soft tissue defects and bone fractures with resulting peripheral nerve injuries.

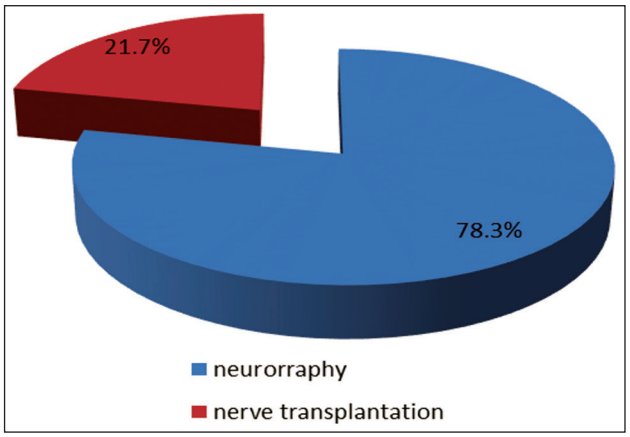


χ33,75=2; p=0,0001

Figure 3. Peripheral nerve destruction presented in percentages

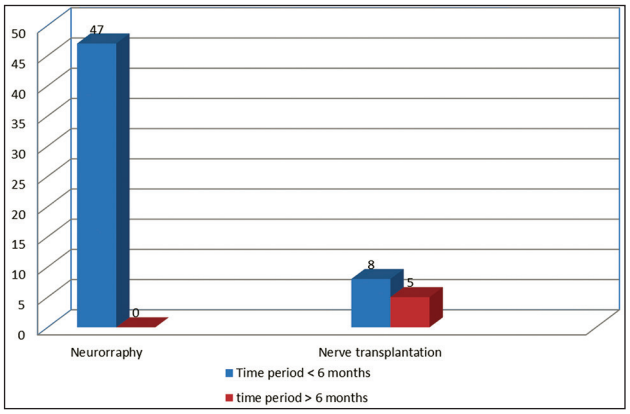
The functional outage, as the result of the peripheral nerve injury (Figure 3), has been associated in the most cases with the complete nerve transection (53 cases; 88.3%), while the partial nerve transection has been evaluated in the lesser percentage (7 cases; 11.7%), with statistically significant difference (p<0,05).

The neurorraphy, one of the peripheral nerve reconstruction modality, has been evaluated in our tested sample in the highest percentage (47 cases; 78.3%) in the relation to the nerve transplantation, which has been evaluated in the lesser percentage (13 cases; 21.7%), with statistically significant deviation from the normal distribution (p<0,05).



χ18,15=2; p=0,0001

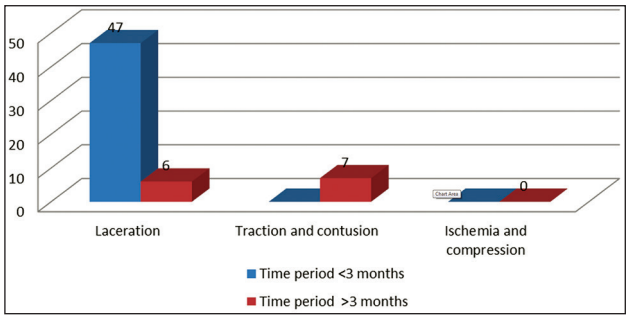
Figure 4. The representation of the peripheral nerve reconstruction modalities



χ2=15,007; p=0,0001

Figure 5. The correlation between the time interval from peripheral nerve injury to the surgery on the operative modality selection

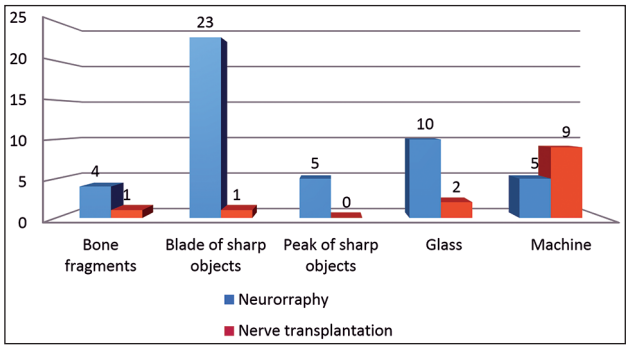
Analyzing our results presented on the Figure 5, it was evident that the neurorraphy has been indicated in all cases within 6 months from the moment of peripheral nerve injury (47 cases; 78.3%) in our tested group of 60 patients. The evaluation of the results of the remaining 13 cases (21.7% of the total number of 60 cases) has confirmed that all patients with peripheral nerve injuries had been operated by the nerve transplantation. Of that number, 8 patients have been operated within 6 months from injury (61.5%) and also 5 patient have been operated after 6 months from the moment of the peripheral nerve injury (38.5%). This selection of the operative modality has been in correlation with no possibility of the direct nerve approximation. The nerve transplantation represented indication in all these cases, with statistically significant difference (p<0,05).



χ^2=23,663; p=0,0001

Figure 6. The correlation between the mechanism of the peripheral nerve injury and the indicated time of the peripheral nerve reconstruction

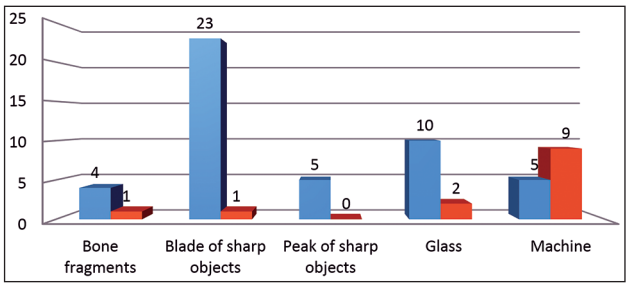
The laceration of the peripheral nerve injury (Figure 6) has represented the indication for the nerve reconstruction within 3 months from the moment of injury (47 cases; 78.3% of the total number of 60 cases). After 3 months, 13 patients with peripheral nerve injuries have been operated (21.7% of the total number of 60 cases), 6 cases with laceration of the peripheral nerve (46.2%) and 7 cases with contusion and traction of the peripheral nerves (53.8%). We have confirmed that there had been statistically significant difference comparing the mechanism of the injury and the indicated time of the peripheral nerve reconstruction (p<0,05). We have evaluated no ischaemia and compression as the mechanism of peripheral nerve injury in 60 evaluated cases.



χ2=2,097; p=0,147

Figure 7. The correlation between the mechanism of the peripheral nervfe injury and operative modality selection

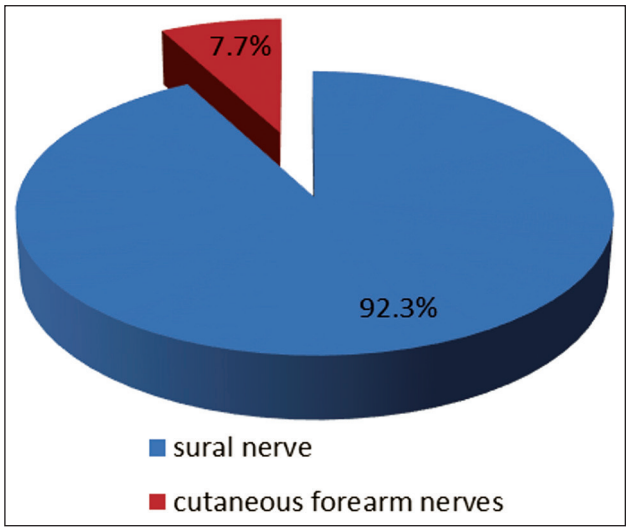
When comparing the mechanism of the peripheral nerve injury with operative modalities, we could evaluate that the neurorraphy had been indicated in the most cases of nerve laceration (43 cases; 71.7% of the total number of 60 cases), while the nerve transplantation had been indicated in the 10 cases of the nerve laceration (16.6% of the total number of cases). Traction and contusion of the peripheral nerves (7 cases; 11.7%) have represented the indication for the neurorraphy (4 cases; 6.7%) and for the nerve transplantation at about the same percentage (3 cases; 5%). We have evaluated no ischaemia and compression as the mechanism of the peripheral nerve injury. There is no statistically significant difference between the mechanism of injury and operative modalities (p>0,05).



χ2=14,253; p=0,0324

Figure 8. Correlation between specified type of the etiological factor and resulting defect in the peripheral nerve continuity

The resulting defect in peripheral nerve continuity has been directly correlated with the specified type of the etiological factor. During data analysis (Figure 8) it has been evident that different specified types of etiological factors had resulted in different lenghts of defects in the peripheral nerve continuity. The sharp objects have mainly resulted in the defects smaller than 2 cm (38 cases; 63.4%), as well as bone fragments (4 cases; 6.7%), which had allowed the direct approximation and reparation of the peripheral nerve. Machines have resulted in the defects in the nerve continuity smaller than 2 cm (5 cases; 8.3%), as well as larger defects than 2 cm (9 cases; 15%). This local findings have presented the indication for the nerve transplantation. The larger defects in the nerve continuity have also been evaluated in the smaller number of cases caused by the injury with glass (2 cases; 3.4%) and by the blade of sharp objects (1 case; 1.7%). There is a statistically significant difference in the type of etiological factor and selected modality of the operative treatment (p<0,05).



χ2=54,15; p=0,00001
Figure 9. The types of the used autografts in peripheral nerve reconstruction

The nerve transplantation, as the operative modality, in our tested group, has been applied in 13 cases (21.7% of the total number of cases). According to our results (Figure 9), the sural nerve has been used as autograft in the most cases (12 cases; 92.3%), while the cutaneous forarm nerve has been used only in 1 case (7.7%), with statistically significant difference (p<0,05).

Discussion

Perpheral nerve injuries are clinically manifested by motor and sensitive outage, with range correlated with the level of nerve injuries and degree of tissue destruction. The functional recovery after peripheral nerve lesions is suboptimal, despite adequate and timely reconstruction ([7]). The first attempt of nerve coaptation has been recorded 600 years BC. Galen has spoken about a possibilty of the nerve regeneration, but it has been proven in 1860 by Augustus Waller ([8]).

Surgery of the nervous system, but first of all the surgery of the peripheral nerves, had began to develop in the first half of the 19th century, but significant progress has been recorded in the last thirty years. The turning point in this field of surgery is the introduction of the operating microscope by Smith and Kurze. The usual etiology of acute traumatic injury of peripheral nerve includes laceration, contusions, tractions, ishemic injury and, rare mechanisms of injury such as electric, radiation, percussion and vibration damage. The usual etiology of acute peripheral nerve trauma includes lacerations, contusions, traction injury, ischemic injury and rare mechanisms of injury such as electric, radiation, percussion and vibration damage. The treatment of these type of injuries implies a good knowledge of anatomy, pathology, pathophysiology, surgical principles, approaches and interests ([9]). Data from the literature correlate with evaluated mechanisms of nerve injury from our research. Laceration are the most common mechanism of nerve injury. Traction and contusion have been evaluated in a smaller number of cases. The statistical analysis with exclusion of ischemia and compression has confirmed that there had no statistical significant difference between the mechanism of the peripheral nerve injury and applied operative modalities (p>0,05).

The analysis of our statistical data has confirmed the high percentage of the peripheral nerve injuries in the level of the hand and wrist, had been associated with complete nerve transection .

The machanism od the nerve injury has significant influence on the time of reconstruction (p<0,05), as well as the time from the moment of nerve injury to the selected time of reconstructive procedure. The mechanism of the injury has also a significant inflence on the operative modelity selection (p<0,05). All the specified etiological factors, with sharp edges, have resulted with the possibility of direct approximation of transected nerve and the neurorraphy, but the other types of the etiological factors have resulted with higher degree of the nerve destruction and thus with no possibilty of the direct nerve repair.

The direct suture of peripheral nerves represents, so-called „end-to-end“ neurorraphy, and if it is possible, represents the most optimal modality of reconstruction. This type of reparation is ideal for the acute phase of pure cutting of the nerve, when the distance between the cut ends of nerve is determined only by longitudinal excursions of the joints beside internal nerve elasticity. When the gap between cut ends of peripheral nerve is longer than 2cm and with no possibility of nerve approximation without tension at the suture line, despite the application of assisted methods, the nerve transplantation was indicated ([11]).

The peripheral nerves of the upper extremities have been injuried in 87% of the cases, comparing

with the injuries of the peripheral nerves of the lower extremities in 13% of the cases ([12]). The results of the study have confirmed the predominance of the lesion of peripheral nerve of the upper extremities in relation to the lower extremities (59:1 or 98.3%: 1.7%). In our estimated group of patients, the predominance of the peripheral nerve injuries of the upper extremities has been evident. Digital palmar nerves have been injuried in the most of the cases ([13]). Our findings are consistent with data from the literature (26 patients or 46.3%).

All surgical procedures elected after half a year from the moment of injury, have considered the application of the free nerve transplants as the most optimal modality. The tendon transposition, indicated in the all cases with no possibilty of the peripheral nerve recovery, has not been indicated in the our tested group.

Conclusion

During the assesment of the peripheral nerve injury, we have to consider a several important factors: mechanism and time of injury, anatomical localisation of the injury with potential involvement of peripheral nerve, functional outage which may be result of compression of bone fragments or result of the partial or complete nerve transection. The traction, as the mechanism of injury, can potentially results with the higher degree of nerve destruction, while ischemia and contusion can result only with localized block of conduction and with spontaneous recovery. Evaluation of the soft tissue cover and tissue equilibrium is important factor for the timing of reconstruction. All mechanisms of injury which jeopardize the vitality of surrounding tissue preclude the primary reparation. Injury with suspect lesion of peripheral nerve is indication for exploration. Evaluation of the degree of nerve and surrounding tissue destruction determine the operative modality. The most of peripheral nerve lesions caused by transection have been surgically treated within 3 months from the moment of injury. After that period, nerve lesions caused by traction and contusion have been reconstructed with defined degree of intra and perineural scarification. All nerve lesions caused by laceration (transection) have been treated by direct reparation due to smaller degree of intraneural destruction. We are not allowed to ingnore the influence of etiologic factors of injury or to indicate reconstruction in the incorrect time due to potential compromising of fuctional recovery and probable indications for reoperation.

References

1. *Moore AM, Wagner IJ, Fox IK. Principles of Nerve Repair in Complex Wounds of the Upper Extremity, Sem. Plast Surg. 2015 Feb; 29(1): 40–47.*
2. *Griffin JW, Hogan MV, Chhabra AB, Deal DN. Peripheral nerve repair and reconstruction. J Bone Joint Surg Am. 2013 Dec 4; 95(23): 211-2151.*
3. *Liu HF, Chen ZG, Lineaweaver WC, Zhang F Can the Babysitter Procedure Improve Nerve Regeneration and Denervated Muscle Atrophy in the Treatment of Peripheral Nerve Injury? Plast Reconstr Surg. 2016 Jul; 138(1): 122-31.*
4. *Ducic I, Fu R, Iorio ML. Innovative treatment of peripheral nerve injuries: combined reconstructive concepts. Ann Plast Surg. 2012 Feb; 68(2): 180-7.*
5. *Means KR Jr, Rinker BD, Higgins JP, Payne SH Jr, Merrell GA, Wilgis EF. A Multicenter, Prospective, Randomized, Pilot Study of Outcomes for Digital Nerve Repair in the Hand Using Hollow Conduit Compared With Processed Allograft Nerve. Hand (N Y). 2016 Jun; 11(2): 144-51.*
6. *Andrea Gagliardo, Francesca Toia Francesco Maggi, Alessio Vincenzo Mariolo,Michele Cillino, Francesco Moschella. Clinical neurophysiology and imaging of nerve injuries: preoperative diagnostic work-up and postoperative monitoring. Plast Aesthet Res. 2015; 2(4): 149-55.*
7. *Hoke A, A (heat) schok to the system promotes peripheral nerve regeneration; J Clin Invest.2011 Nov 1; 121(11): 4231-4234.*
8. *Anđelković S, Lešić A, Vučković Č, Sudić V, Bumbaširević M: Srp Arh Celok Lek. 2011 Nov-Dec; 139(11-12): 780-783.*
9. *Samardžić M, Antunović V, Grujičić D: Povrede i oboljenja perifernih nerava, Zavod za udžbenike i nastavna sredstva, Beograd 1998; 56-256.*
10. *Campbell W, Evaluation and menagment of peripheral nerve injury; Clinical neurophysiology, 2008; vol. 119: 1951-1965.*
11. *Samardžić M. Mikrohirurško lečenje povreda perifernih nerava, ACI, Beograd 2002; vol. 50: 7-14.*

12. *Scholz T, Krichevsky A, Sumarto A, Jaffurs D, Wirth GA, Paydar K, Evans G. Peripheral nerve injuries: an international survey of current treatmentsand future perspectives. J Reconstructive Microsurgery 2009; 25(6): 339–44.*

13. *McAllister RM, Gilbert SA, Calder JS, Smith PJ. The epidemiology and management of upper limb peripheral nerve injuries in modern practice, J Hand Surg, 1996; 21: 4-13.*

Corresponding Author
Sanela Salihagic,
Clinic for reconstructive and plastic surgery,
University Clinical Center Sarajevo,
Bosnia and Herzegovina,
E mail: sanela.salihagic@yahoo.com

Flexible model inclusive teaching in the entire organization of work teaching students with disabilities

Fleksibilan model inkluzivne nastave u organizaciji cjelokupnog rada učenika sa teškoćama u učenju i učešću

Dragana Aleksic[1], Mensura Kudumovic[2]

[1] Elementary School "Lijesce", Brod, Bosnia and Herzegovina,
[2] Faculty of Educational Sciences, University of Sarajevo, Sarajevo, Bosnia and Herzegovina.

Abstract

Life in the XXI century, the rapid development of science and technology leads to major changes in all spheres of life. Existing educational - education system is also a consequence of the many social changes. However, it is still a lot of work and effort to make the existing educational - educational system was unable to all children, without exception, to enable independent living in the XXI century. Lately, in the world and in our country, is very topical issue of children with barriers to learning and participation. In many countries, including ours, are being explored flexible models of organization total workload at school with only one goal: to better understand the difficulties that children face during their education. To achieve its educational - educational function, modern school should be comprehensive, flexible enough and able to meet the cognitive needs and interests of young people and adults, regardless of their differences. Recently, the current issue of inclusion. It was created as the need to terminate the exclusion and segregation of children. Inclusion of today has a large number of supporters, but there are still a large number of those who think segregation of children with special needs. Therefore, this study is dedicated to the opinions of teachers of children with learning disabilities and participation which are already included or to be included in the regular educational - educational institutions. Part of the work was paid to the acceptance of such children in the group, department, because precisely that need to show a sense of inclusion. If these children are accepted by their peers not only to achieve good for them, but we will achieve the generations who have developed a feel for the needs of others and tolerance for diversity. Done and research Lijesce Primary School and Primary School Sveti Sava in Brod, where teachers expressed their opinions about inclusive education.

Keywords: Special Needs, students with disabilities, inclusive teaching.

Sažetak

Život u XXI vijeku, nagli razvoj nauke, tehnike i tehnologije dovodi do velikih promjena u svim sferama života. Postojeći vaspitno - obrazovni sistem je takođe posljedica brojnih društvenih promjena. Međutim, potrebno je još mnogo rada i truda da bi postojeći vaspitno - obrazovni sistem bio u stanju da svu djecu, bez izuzetka, osposobi za samostalan život u XXI vijeku. U poslednje vrijeme, u svijetu i kod nas, je veoma aktuelno pitanje djece sa preprekama u učenju i učešću. U mnogim zemljama svijeta, pa i kod nas, istražuju se fleksibilniji modeli organizacije ukupnog rada u školi s jednim jedinim ciljem, da se bolje shvate teškoće na koje djeca nailaze tokom školovanja. Da bi ostvarila svoju vaspitno - obrazovnu funkciju, savremena škola treba da bude sveobuhvatna, dovoljno fleksibilna i sposobna da zadovolji saznajne potrebe i interesovanja mladih i odraslih bez obzira na njihove različitosti. U poslednje vrijeme je aktuelno pitanje inkluzije. Ona je nastala kao potreba da se prekine sa ekskluzijom i segregacijom djece. Inkluzija danas ima veliki broj zagovornika, ali još uvijek je i veliki broj onih koji segregacijski razmišljaju o djeci sa posebnim potrebama. Zbog

toga je ovaj rad i posvećen mišljenjima nastavnika prema djeci sa teškoćama u učenju i učešću koja su već uključena ili trebaju da budu uključena u redovne vaspitno - obrazovne ustanove. Istraživanje je rađeno u dvije osnovne osnovne škole. Istraživanjem je obuhvaćen uzorak od 47 ispitanika. Ispitanici su iznosili svoja mišljenja, stavove i prijedloge oko realizacije inkluzivne nastave, te njene prednosti i nedostatke, odnosno stvaranje prijedloga za izvodjenje nastavnog procesa u cilju efikasnije nastave, te bolje pozicije svih učenika.

Dio rada smo posvetili i prihvaćenosti takve djece u grupi, odjeljenju, jer upravo u tome treba da se pokaže smisao inkluzije. Ukoliko ta djeca budu prihvaćena od svojih vršnjaka nećemo samo postići dobro za njih, već ćemo postići i naraštaje koji su razvili osjećaj za tuđe potrebe i toleranciju prema različitostima. Urađeno je i istraživanje u Osnovnoj školi Liješće i Osnovnoj školi Sveti Sava na području Opštine Brod, gdje su nastavnici iskazali svoja mišljenja oko inkluzivne nastave.

Ključne riječi: Posebne potrebe, učenici sa teškoćama, inkluzivna nastava.

Uvod

Nastava ranijih godina se pretežno odnosila na učenje i poučavanje prosječnih učenika. Učenici sa poteškoćama u razvoju, u nastavnom procesu su bili zapostavljeni u smislu daljeg napredovanja. Često su bili prepušteni sami sebi. Nisu bili u mogućnosti da zadovoljavaju svoje individualne potrebe. Bili su odbacivani, te im se nije poklanjala dovoljna pažnja. Nakon dugo vremena javlja se ideja za specijalnim školstvom, međutim nije bilo puno nastavnika koji su bili obučeni za izvođenje tog tipa nastave. U vezi s tim nedostatkom javlja se još jedna ideja, odnosno uvođenje inkluzije u naše škole, što predstavlja pozitivan stav prema ovim učenicima, a tako i prema školstvu uopšte. Za inkluzivnu nastavu možemo između ostalog reći, da je to inkluzivna škola, odnosno mjesto gdje svako pripada, svako je prihvaćen, podržava i biva podržavan od strane svojih vršnjaka i drugih članova školske zajednice kako bi se izašlo u susret njegovim obrazovnim potrebama. Svi učenici, bez obzira na različitosti, bi trebali da imaju jednake šanse da budu uključeni u redovan vaspitno obrazovni sistem školovanja.

Istorijski osvrt na djecu sa posebnim potrebama i specijalno školstvo

Odnos prema djeci sa preprekama u učenju i učešću se kroz istoriju mijenjao. Taj odnos je vijekovima bio segregacijski. Stara pedagoška nastojanja na našim prostorima bila su više usmjerena na kategorizaciju i razdvajanje djece na sposobnu i nesposobnu, na vrijednu i lijenu itd. To je bio dug put, od veoma surovog odnosa i fizičke likvidacije, preko odbacivanja, segregacije, integracije, do današnje ideje o inkluziji. Ne postoje pouzdani podaci o tome kakav je bio odnos prema djeci sa preprekama u učenju i učešću u prvobitnoj zajednici. Prvi istorijski izvori i zapisi pokazuju da lica koja nisu bila sposobna da sama obezbijede hranu i da se brinu o sebi, morali su biti žrtve samog načina života. Ova činjenica se donekle može objasniti proizvodnim odnosima koji su vladali u tom periodu. Proizvodni odnosi su bili na tom nivou da produktivni dio stanovništva nije mogao obezbijediti višak osnovinih životnih namirnica za sve, što se posebno odnosi na nesposobne za privređivanje i djecu sa teškoćama u učenju i učešću (1).

U antičkim robovlasničkim državama, a posebno u Sparti, djeca za koju se pretpostavljalo da su fizički i psihički nesposobna nisu ostavljana u životu. Naime, mladi spartanci su odmah po rođenju bili podvrgavani oštroj selekciji, nerazvijena i bolesna djeca su osuđivana na smrt. Ta ubistva su pravdana težnjom da se stvara tjelesno i duševno zdravo potomstvo. Osnovni cilj im je bio da se formiraju zdravi, jaki i sposobni ratnici. Svako novorođeno dijete je pažljivo pregledano od najstarijih članova plemena. Ukliko se odredi da je slabo i zakržljalo moralo se baciti u provaliju Apoteta na strmini planine Tajget. U periodu feudalizma nije pridavan nikakv značaj razvoju pedagoškog pristupa u vaspitanju djece sa preprekama.U epohi humanizma i renesanse, čitava plejada mislilaca i humanista bavila se pitanjem pedagogije i vaspitanja. U ovom periodu su primjetni napori progresivnih snaga društva u borbi sa religioznim shvatanjima obrazovanja i vaspitanja djece, a naročito djece sa posebnim potrebama. Jan Amos Komenski (1592 - 1670) prvi iznosi ideju o potrebi obrazovanja gluhih, slijepih i ostalih hendikepiranih. Njegova misao da se sa djecom ne pokušava ništa drugo što njihove godine ne dopuštaju i traže ostala je aktuelna do danas. Poznati švajcarski peda-

gog, Hajnrih Pestaloci (1746 —1827), pod uticajem Komenskog, ukazuje na potrebu vaspitanja i obuke tupoumnih. On određuje izvjesne pedagoške principe u obuci tupoumnih: obuka prema individualnim mogućnostima, korišćenje didaktičkog materijala, istovremeno umno i fizičko vaspitanje, povezivanje obuke sa proizvodnim radom. Posebno naglašava značaj principa očiglednosti koji treba da obezbijedi normalan razvoj uma. Nasuprot progresivnim idejama mnogih mislilaca, pristup djeci sa teškoćama nije se promjenio. Najviše zasluga za postavljanje temelja medicinskog tretmana mentalno zaostalih ima Francuska. Dugo vremena se smatralo da su duševni bolesnici opsjednuti zlim silama, demonima ili đavolom. Za istjerivanje demona korištene su molitve i vradžbine, a kada to nije „pomagalo“ pristupalo se fizičkom kažnjavanju. Filip Pinel (1745 — 1826) je prvi isključio fizičko kažnjavanje duševnih bolesnika, tako što je skinuo lance sa bolesnika u Pariskoj bolnici 1793. godine. Poseban doprinos normalnijem i demokratičnijem odnosu prema djeci učinile su UN još 1959. godine poznatom Konvencijom o pravima djeteta i ranijom Deklaracijom o pravima čovjeka, koje predstavljaju dva važna dokumenta na čijim je osnovnim postavkama i zahtjevima bazirana ideja o inkluziji djece sa posebnim potrebama u školski sistem. Smatra se da inkluzija djece sa posebnim potrebama u školski sistem kao ideja i kao pokret, dobija internacionalne razmjere donošenjem Svjetske Deklaracije o obrazovanju za sve, 1990. godine (1). Na prostorima bivše Jugoslavije prvi pokušaji rada sa mentalno zaostalom djecom datiraju tek od 1912. godine, a sa tjelesno invalidnom od 1918. godine. Veliki napredak vezuje se za period posle Drugog svjetskog rata kada se pristupilo izgradnji određenih ustanova za osposobljavanje djece sa posebnim potrebama. Sve do dvadesetih godina prošlog vijeka u svijetu je postojalo vrlo malo specijalnih nastavnika, odnosno nastavnika koji su osposobljeni za rad sa djecom i omladinom sa teškoćama u učenju i učešću. Kasnije dolazi do porasta broja specijalnih odjeljenja, a već tridesetih godina njihov se broj drastično smanjuje. Do sredine prošlog vijeka osobe sa posebnim potrebama u učenju učešću bile su obuhvaćene isključivo segregacijskim sistemom. Medicinski pristup je prevladao šezdesetih godina, kada društvo usmjerava svoje aktivnosti na „teškoću“, „nesposobnost“ i preduzima mjere kojima se ustanovljavaju specijalne službe i specijalni postupci. U snažnom poslijeratnom razvoju obrazovanja od 1945. godine u BiH su urađeni prvi temelji organizovanom društvenom razvoju specijalnog školstva. Tako počinje da se stvara i razvija u našoj državi jedna nova grana školskog sistema - specijalno školstvo, koje do tada nije imalo tradicije, te je razumljivo da je uspon bio težak. Iako se specijalno školstvo u BiH počelo sistematski i organizovano razvijati tek poslije završetka Drugog svjetskog rata, ipak o njemu u našoj državi ima malo autentičnih podataka i dokumenata, a posebno iz prvih poslijeratnih godina, kada su i osnovane prve specijalne ustanove trajnog karaktera u istoriji specijalnog školstva ove države. Prva ustanova za lako mentalno retardiranu djecu, na ovim prostorima, otvorena je u franjevačkom samostanu u Petrićevcu kod Banja Luke. Nakon specijalnih škola i specijalnih odjeljenja u kojima su se školovala djeca sa teškoćama u učenju i učešću, javlja se inkluzija kao savremeni način školovanja. Inkluzija predstavlja zajedničko školovanje svih pod jednakim uslovima, bez obzira na različitosti.

Klasifikacija djece sa preprekama u učenju i učešću u BIH

Istraživanje koje je uradila radna grupa za inkluziju (UNICEF, OSCE, 2004), „Individualizacija i inkluzija u obrazovanju“, razlikuje sljedeće kategorije:

- Smetnje u intelektualnom razvoju
- Smetnje govora i glasa
- Smetnje čula sluha
- Smetnje čula vida
- Hronična oboljenja
- Višestruke smetnje
- Smetnje u ponašanju
- Epilepsija
- Pedagoški zanemarena djeca
- Zlostavljana djeca
- Samopovređivanje i suicidnost
- Djeca sa postraumatskim stresnim sindromom
- Djeca povratnici
- Pripadnici manjinskih grupa
- Djeca iz nepotpunih porodica.

Klasifikacija djece prema razvojnim i funkcionalnim smetnjama

Klasifikacija djece prema funkcionalnim i razvojnim smetnjama i učestalost njihovog javljanja varira od države do države, od regije do regije. Prema podacima koje smo pronašli u udžbeniku „Specijalna pedagogija sa metodikom" istraživački tim OECD - a 1988. godine predložio je klasifikaciju funkcionalnih smetnji u razvoju na šest kategorija:

1. Oštećenje senzornih funkcija (oštećenje vida, sluha, osjećaj bola, dodira, kretanja i ravnoteže);
2. Poremećaji kognitivnih, intelektualnih, perceptivnih i funkcija pažnje (mentalna zaostalost, poremećaji učenja, govorne disfunkcije, poremećaji pažnje i sl.);
3. Poremećaji kontrole mišića (cerebralna paraliza, ortopedski poremećaji, poremećaji u govornoj artikulaciji, amputacije, mišićna slabost i sl.);
4. Oštećenje fizičkog zdravlja djeteta (metabolički fiziološki poremećaji kao što su finilektonurija, hipotipiodizam, juvenilni dijabetes, urođene bolesti srca, i sl.);
5. Emocionalni dječiji poremećaji (situacioni poremećaji, dječije neuroze, dječije psihoze, emocionalne promjene izazvane oštećenjem nervnog sistema i sl.);
6. Spoljašnji faktori: asocijalne ili haotične porodice, neodgovorno ponašanje roditelja, zapostavljanje djece od strane roditelja, teži oblici neuroza roditelja, psihotični roditelji i sl. (2).

Učenici sa teškoćama i poremećajima u čitanju, pisanju i učenju osnovnih matematičkih sadržaja

Razvojna disleksija je teškoća u oblasti čitanja, pri čemu dijete ne uspijeva da čita tečno, ni onda nikada su djeca istog uzrasta, iste inteligencije i iste marljivosti savladala ovu tehniku. Čitajući dijete dodaje slova iz sljedećih riječi, izostavlja slova (glasove) iz riječi, sriče, što čitanje otežava. Zamjenjuje slova koja se pišu slično. Dobro čuje, ali na nalog da napiše znakove glasova sličnih po zvučnosti miješa ih.

Razvojna disgrafija je teškoća u oblasti pisanja pisanja. Dok djeca istog uzrasta, iste inteligencije, i iste vrednoće ili treninga uspiju da savladaju pisanje, dotle dijete sa razvojnom distrafijom to još uvijek ne uspijeva. Djeca koja imaju disgrafiju obično pišu bez margina, redovi su talasasti i ulomljeni. Rukopis je u cjelini neuredan sa brojnim mrljama, koje zatvaraju okrugline slova. Slova su neujednačene veličine.

Dijete koje ima ***razvojnu diskalkuliju*** sa teškoćom savladava obuku matematike. Čita, govori i piše dobro. Inteligencija može biti iznad prosjeka. Ova djeca zaostaju obično u građenju sinteza. Na primjer, broj 102 pišu kao 1002, broj 115 pišu kao 10015 (3). Sa teškoćom pravilno potpisuju brojeve, pa im je rezultat uvijek loš.

Djeca sa oštećenjem vida

U pedagoškom i obrazovnom smislu učenike sa oštećenjem vida dijelimo u dvije grupe:

- slijepi učenici koji ne mogu čitati tekst veličine Jeager 8 i manji ((font Times New Roman 22). Oni se obrazuju na Brailleovom pismu.
- slabovidi učenici koji čitaju slova veličine Jeager 8.

Ostatak vida na boljem oku, uz korekciju ili bez nje, kod ovih učenika kreće se od 0,00 do 0,40.

Simptomi koji mogu ukazati na smetnje vida su:

- često trljanje očiju rukama, ili pokušaj tipa „da se mrlja ili zamagljenje odstrani iz oka,
- razdražljivost i plač pri upotrebi vida na blizinu pri gledanju u udaljene predmete,
- drži tijelo napeto,
- podiže lice i pogled prema gore,
- okreće lice ili pogled u stranu,
- gura glavu naprijed i sl.
- Za vrijeme čitanja:
- drži knjigu predaleko,
- drži knjigu preblizu,
- često mijenja odstojanje knjige,
- nije pažljiv za vrijeme čitanja,
- često prekida čitanje ili pisanje, - zatvara ili pokriva jedno oko,
- naginje glavu na jednu stranu,
- zamjenjuje slogove i riječi u čitanju,
- često gubi mjesto na stranici,
- brka padeže i znakove interpunkcije: ne vidi tačku i zarez, dvije tačke, navodne znake, ć, đ, dž, nj, j (4).

Djeca sa oštećenjem Vida u inkluzivnoj školi ne zaostaju u intelektualnom razvoju za vršnjacima

koji vide, i savladavaju redovni nastavni plan i program predviđen za pojedini razred. Učenici sa oštećenjem vida upoznaju svijet, komuniciraju i uče koristeći preostala osjetila. Za slijepe je najvažnija taktilna percepcija, sluh i govor. Svakako se koristi i ostatak vida ako postoji. Zbog specifičnosti taktilne percepcije, ovim je učenicima potrebno osigurati više vremena za pojedine aktivnosti na času i uputiti ih da zadatke dovrše kod kuće.

Inkluzivna nastava

Neki smatraju da se u porodicama koje imaju dijete sa posebnom potrebom javljaju problemi koji gotovo ne postoje u porodicama bez takve djece. Prihvatiti nedostatak kod djeteta nije lako, ni roditeljima, ni članovima porodice, ali može da bude presudan element kako bi se pridonijelo boljem kvalitetu njegovog života. Ukoliko dijete osjeti da je prihvaćeno od strane roditelja to će se pozitivno odraziti na razvoj i njegovu socijalizaciju i obrnuto. Samo saznanje o nedostatku je dovoljno teško, ali ako se dijete i porodica suočavaju i sa negativnim iskustvima koja dolaze iz sredine u kojoj žive, situacija se dodatno pogoršava. Kako kaže stara narodna poslovica „I na polju divne pšenice mora rasti kukolj“,tako ne postoji ni kultura u kojoj su svi pripadnici potpuno isti. U kulturama koje imaju pozitivan odnos prema ovom djelu populacije, uvijek će se naći neko ko nije takav, kao i u kulturama koje imaju negativan odnos naći će se neko ko će pružiti podršku i razumjevanje osobama sa preprekama i njihovim porodicama.

Inkluzija je ključni termin u nazivu inkluzivna nastava i u tangentnim pojmovima. Riječ inkluzija ima sljedeća značenja: uključivanje, sadržavanje, obuhvaćanje, podrazumijevanje, primjesa, sastojak itd. (5). Termin kinkluzija» preuzet je iz latinskog jezika u engleski jezik i u ostale (živež jezike, među kojima je i naš jezik. Njegovo opšte značenje je uključivanje, obuhvatanje svih, sadržavanje. Opisni pridjev inkluzivna potiče iz latinskog jezika, kao što je već i istaknuto. Riječ nastava ima opšte poznato značenje, koje je uglavnom usaglašeno u didaktičkoj i leksikografskoj literaturi i u nastavnoj praksi (3). Polazeći od navedenih opštih značenja inkluzije, možemo reći da je inkluzivna nastava didaktički model organizovanog poučavanja i učenja koji obuhvata, prihvata i intenzivno uključuje djecu i mlade sa preprekama u učenju i učešću, odnosno učenike sa posebnim obrazovnim potrebama, (tj. sa razvojnim teškoćama i darovite, povratnike, doseljenike, pripadnike nacionalnih manjina, i sve ostale učenike u odjeljenju, prema njihovim individualnim potencijalima. (4). U ovom radu prihvatamo značenje inkluzivne nastave, jer inkluzivna nastava intenzivno uključuje djecu sa preprekama u redovan školski sistem, bez odbacivanja predrasuda. Takvoj djeci omogućuje ravnopravnost među ostalom djecom. Umjesto termina kučenici sa preprekama u učenju i učešću do nedavno je upotrebljavana neodgovarajuća sintagma učenici sa posebnim «potrebama»(3).

Uobičajena sintagma (posebne obrazovne potrebeh manje je adekvatna jer implicira etiketu koja može dovesti do smanjenih očekivanja, skretanja pažnje sa izvora spoljašnjih teškoća (obrazovna politika, školska organizacija, program, međuljudski odnosi, pristupi nastavi i učenju), zanemarivanja problema drugih učenika bez etikete i do rasipanja napora škole da bi odgovorila na razlike među učenicima različitih kategorija, iskustava, itd.

Osnovne odrednice inkluzivne nastave

Analizom teorijskih shvatanja, rezultata empirijskih istraživanja i pozitivnih iskustava, može se doći do utvrđivanja sljedećih odrednica inkluzivne nastave:

1. Ravnopravno učestvovanje u redovnoj nastavi one iste škole koju bi pohađali učenici i da nemaju prepreke u učenju i učešću (tzv. posebne potrebe),
2. obrazovanje i vaspitanje u odgovarajućem razredu redovne škole svih učenika bez obzira na prirodu prepreka u učenju i učešću,
3. participacija svih učenika (sa razvojnim teškoćama, darovitih i ostalih) u procesu sticanja znanja, usavršavanja vještina, formiranju navika, razvijanju sposobnosti osjećanja i volje u redovnoj nastavi s obzirom na individualne potencijale (u zoni bliskog razvoja) do ličnih maksimuma,
4. uključivanje učenika sa preprekama u učenju i učeću ne samo u redovnu nastavu razreda, već i u vannastavne aktivnosti,
5. isti raspored časova za učenike sa preprekama u učenju i učešću i za ostale učenike odgovarajućeg odjeljenja,

6. omogućavanje realizacije programa individualizovanog učenja u redovnoj nastavi prema profilu određenog učenika sa teškoćama u razvoju,
7. stvaranje prijatne emocionalne atmosfere, ugodnog socijalno-komunikacijskog okruženja i njegovanje prijateljstva između djece sa preprekama u učenju i učešću i ostalih učenika u nastavi i školi,
8. pružanje neophodne dodatne pomoći učenicima sa preprekama u učenju i učešću i ostalim učenicima u redovnoj nastavi,
9. permanentno osvješćivanje razumijevanja i prihvatanja ljudskih u sve djece i mladih u redovnoj nastavi i drugim vidovima vaspitno-obrazovnog rada i života u školi i van nje (3).

Nesređene porodične situacije, prisutnost i uticaj medija, poremećene vrijednosti, sve se to odražava na prirodu djetinjstva. Dijete danas proživljava stresne situacije, čak u naizgled bezazlenim trenucima dok sjedi i gleda crtani film. Škola nažalost takođe predstavlja izvor stresa za mnogu djecu, naročito onu sa posebnim potrebama. Poznato je da stalni stres, van nekih razumnih okvira, može uticati na brzo i ozbiljno narušavanje zdravlja. On utiče gotovo na sve procese u organizmu počev od fizičkih preko emotivnih, kognitivnih do funkcionalnih. Djeci treba pomoći da nauče kako da se nose i izbore sa stresom a ne dodatno ga pojačavati. Ni stavljanje djeteta pod „stakleno zvono" - pretjerana briga i zaštita djeteta - nije adekvatan odgovor na stres jer se isključuje pozitivni aspekat stresa.

Primjenom inkluzivne nastave komunikacija između učenika i nastavnika je na pozitivno zavidnom nivou. Učenici se osjećaju ravnopravnim svojim učiteljima, sarađuju, informacije se odvijaju višesmjerno, te zajedno postižu rezultate. Nastavnici se edukuju pomoću Interneta I sarađuju sa kolegana koji imaju slične problem. Na taj način učenicima je omogućena pomoć od strane nastavnika, kao i stalna povratna informacija, što predstavlja veoma važnu odrednicu cjelokupne nastave. (6).

Od tradicionalne do inkluzivne nastave

Tradicionalna nastava sa više zasnivala na dominantnosti nastavnika i njegovom frontalnom radu sa učenicima. Učenici su bili posmatrači u nastavi i teže su napredovali. Učenici sa preprekama su odvajani u posebna tzv. specijalna odjeljenja, gdje su se osjećali usamljeni i otuđeni. Danas je to nešto drugačije. Učenicima je omogućeno istovremeno zajedničko školovanje zahvaljujući inkluzivnoj nastavi. Učenici se više segregacijski ne odvajaju, nego se inkluzivnom nastvom uključuju u redovan školski sistem. Inkluzivna nastava je novi model nastave koja omogućava ravnopravno učešće svih učenika u redovnoj nastavi, za razliku od tradicionalne gdje su učenici sa teškoćama bili odvajani od ostalih učenika, kako smo već navodili (3).

Uvođenje inkluzije u vaspitno - obrazovni proces zahtijeva da se pored materijalnih uslova obezbjede i stručno osposobljena lica koja će imati značajnu ulogu u radu s djecom sa preprekama. Nažalost, u većini slučajeva u našim školama i vrtićima imamo samo pedagoge i psihologe. Veoma je bitno za dijete da se izgradi međusobno pozitivan odnos i da u tim licima prepozna prijatelja. Vaspitačima, učiteljima i roditeljima pedagog daje posebna uputstva za rad sa ovom djecom. On motiviše na rad, upućuje na metode i tehnike uspješnog učenja, pomaže u realnom planiranju profesionalnog razvoja te prati emocionalni i socijalni razvoj. Psiholog ima zadatak da utvrdi kakvo je stanje neke psihičke strukture ili funkcije određenim instrumentima ispitivanja, te metodama. Osposobljavanju učitelja i vaspitača za rad sa ovakvom djecom treba posvetiti posebnu pažnju. Metodološko i stručno metodičko osposobljavanje nastavnika za individualizaciju učenja u inkluzivnoj nastavi, i identifikaciju individualnih razlika učenika naročito bitno ističe Mile Ilić. Na razvijanje pozitivnih stavova prema uključivanju djece sa preprekama u redovna odjeljenja moguće je uticati dodatnom edukacijom. Veoma je važno da i vaspitači i učitelji razmišljaju o razvijanju i unapređivanju očuvanih potencijala, a ne da budu opterećeni nedostacima pojedine djece. Tu mogu mnogo doprinjeti predškolske ustanove s obzirom da su aktivnosti u njima fleksibilnije i da ih je lakše prilagoditi djetetu. Vaspitače i nastavnike može manje ili više podstaći prisustvo ove djece da razvijaju one metode rada koje će biti u većem skladu sa potrebama svih i na taj način podići na viši nivo kvalitet obrazovanja za svu djecu. Još jedan zadatak nastavnika je da pokazatelje razvoja i postignuća određenog djeteta sa preprekama sažeto prikazuju u „profilu". Oni moraju biti spremni da ih prihvate ali i da osposobe drugu djecu da poštuju i prihvataju jedni druge. Izraženost nekih osobina dijete relativno brzo spozna i u zavisnosti

od toga ono uspostavlja odgovarajuće interpersonalne odnose sa svojim vaspitačima i nastavnicima. Dijete formira sliku o sebi na osnovu odnosa vršnjaka, vaspitača i nastavnika prema njemu, kao i njegovog odnosa prema njima. Suzić, istražujući osobine nastavnika, utvrđuje da elementi poput: motivacije, emocionalne klime na času, didaktičke organizacije časa i prilagođenosti nastave kognitivnom stilu učenika zavise upravo od osobina nastavnika (7). Da bi nastavnik bio uspješan, po njemu, treba da:

- poznaje razvojne karakteristike učenika,
- poznaje sadržaj programa koji realizuje,
- posjeduje nužni nivo kreativnosti, što mu omogućava prilagođavanje sadržaja i metoda rada sposobnostima učenika,
- poznaje i iskustveno vlada didaktičko - metodičkim,
- posjeduje nužni entuzijazam i volju da obavlja posao koji radi (8).

Zbog toga je veoma važno da sa njima rade kooperativni nastavnici koji suzbijaju razdvajanje učenika, stavljaju naglasak na zajednički rad i izazivaju poželjnu emocionalnu klimu na svojim časovima. Sve značajnija uloga u inkluziji se danas sve više prepušta defektologu koji je stručno osposobljen za tretman različitih vrsta posebnih potreba. On identifikuje posebnu potrebu, pruža pomoć učitelju i vaspitaču, pomaže u izboru načina rada, načinu praćenja aktivnosti djeteta, planiranju i sl.

Metodologija

Urađeno je, istraživanje u 2 osnovne škole, Osnovna škola „Liješće“ i Osnovna škola „Sveti Sava“ na području Opštine Brod. Istraživanjem je obuhvaćen uzorak od 47 ispitanika. Ispitanici su iznosili svoja mišljenja, stavove i prijedloge oko realizacije inkluzivne nastave, te njene prednosti i nedostatke, odnosno stvaranje prijedloga za izvodjenje nastavnog procesa u cilju efikasnije nastave, te bolje pozicije svih učenika. Metoda prikupljanja podataka bila je metoda ispitivanja, putem anketnog upitnika kao nosača podataka. Ispitivanje prihvata saznanja drugih i iskaz o njima kao valjan osnov kolektivnog saznanja. S obzirom da ljudi konkretno žive u stvarnosti, da oni tu stvarnost posmatraju, doživljavaju, međusobno o njoj komuniciraju, to je opravdano stanovište da oni imaju iskustva o stvarnosti o kojoj su spoznali, u našem slučaju učitelji, nastavnici su aktivni učesnici nastavnog plana i programa. Tehnika je bila anketiranje, koja podrazumijeva sistematičnost, relativnu kratkotrajnost i ekonomičnost (9). Instrument koji se koristio za ovo istraživanje bio je anketni upitnik.

Neki od zadataka istraživanja su se odnosili na sljedeće:

- Ispitati nastavnike da li se zalažu za izvođenje nastave modelom inkluzivne nastave.
- Provjeriti da li pomoću inkluzivne nastave učenici sa teškoćama dolaze do boljih rezultata rada.
- Utvrditi da li je veći stepen komunikacije i socijalizacije svih pripadnika razreda bez obzira na različitosti inkluzivnom nastavom u odnosu na tradicionalnu nastavu.
- Ustanoviti da li je prisutna prijatna radna atmosfera.
- Ispitati koje su prednosti inkluzivne nastave.
- Ispitati koji su nedostaci inkluzivne nastave.

Navedeno je nekoliko zadataka koji se odnose na izvođenje inkluzivne nastave u vaspitno-obrazovnom procesu. Anketirani nastavnici su izrazili svoja mišljenja pomoću ankte, ali su i dali još nekoliko preporuka usmeno, pri peuzimanju anketa, koje smo zabilježili posebno. Ovi zadaci mogu dati jasne i dobre smjernice za dalji razvoj inkluzije kao fleksibilnog modela nastave cjelokupnog školskog sistema.

Rezultati

Kroz sljedećih sedam tabela prikazan je dio istraživanja manjeg obima:

Tabela 1. Sa učenicima koji imaju teškoće u nastavi treba raditi pomoću modela inkluzivne nastave

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	12,77%
3	slažem se	87,23%
	Ukupno	**100%**

87% ispitanika se slaže da sa učenicima koji imaju teškoće u nastavi treba raditi pomoću modela inkluzivne nastave, ali i da nastavnici trebaju da dobijaju određenu stručnu pomoć za rad sa ovim učenicima, te da se organizuje više stručnih skupova, seminara vezano za ovu tematiku.

Tabela 2. Učenici sa teškoćama, učenjem pomoću modela inkluzivne nastave dolaze do boljih rezultata rada

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	21,28%
3	slažem se	78,72%
	Ukupno	**100%**

Iz prethodne tabele vidimo da nekoliko nastavnika, tačnije njih 21,28% nije baš sigurno da primjenom inkluzivnom nastavom učenici dolaze do boljih rezultata rada, što je zanimljivo, ali ipak velika većina njih se zalaže za inkluziju koja po njima omogućava bolje i efikasnije rezultate rada.

Tabela 3. Primjenom inkluzivne nastave stepen komunikacije i socijalizacije je na većem nivou u odnosu na tradicionalni, klasični sistem nastave koji je bio dugi niz godina, gdje se djeca sa teškoćama nisu uključivala u redovnu nastavu

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	0%
3	slažem se	100%
	Ukupno	**100%**

Vezano za prethodnu konstataciju svi ispitanici su se izjasnili pozitivno, odnosno svih 47 ispitanika, 100% se slaže da primjena inkluzije omogućava veoma veći stepen komunikacije i socijalizacije kod svih učenika, a posebno kod učenika sa teškoćama kojima je to neophodno.

Tabela 4. Primjena inkluzivne nastave omogućava prijatnu i ugodnu radnu atmosferu

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	4.25%
3	slažem se	95,75%
	Ukupno	**100%**

Tabela 5. Inkluzivna nastava omogućava razvoj svakog pojedinca prema njegovim individualnim potrebama

Rb	Odgovor	%
1	ne slažem se	6.38%
2	nisam siguran	12,77%
3	slažem se	80,85%
	Ukupno	**100%**

Tabela 6. Da bi se uspješno realizovala inkluzivna nastava, s obzirom da su redovni nastavnici preopterećeni nastavnim planom i programom, potrebna im je stručna pomoć od strane defektologa

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	0%
3	slažem se	100%
	Ukupno	**100%**

U prethodno navedenoj tabeli vidimo zanimljivu činjenicu. Nastavnicima je potrebna pomoć u radu sa djecom koja imaju poteškoće u nastavi, iz razloga što su preopterećeni nastavnim planom i programom, kako nastavnici tako i učenici, a sve u cilju efikasnije nastave.

Tabela 7. Učenici sa teškoćama u inkluzivnoj nastavi pored nastavnika bi trebali imati i svog asistenta koji će im pomagati u radu

Rb	Odgovor	%
1	ne slažem se	0%
2	nisam siguran	8,51%
3	slažem se	91,49%
	Ukupno	**100%**

Vidljivo je da se velika većina nastavnika zalaže za inkluzivnu nastavu, ali uz pomoć stručnih lica, iz razloga što nastavnici nemaju dovoljno vremena da se samostalno posvete svakom učeniku pojedinačno. Navode, da u saradnji sa defkotologom i asistentom za ove učenike inkluzivna nastava bi dobila na svojoj važnosti, te bi se primjenjivala na adekvatan i kvalitetan način.

Zaključci

U današnjem vremenu veoma je aktuelno pitanje reforme školskog sistema, a u okviru toga i pitanje inkluzije. Pokušali smo ovoj problematici prići i sa teorijskog, i sa empirijskog stanovišta. Koliko god za inkluziju bili bitni programi prilagođeni vrsti posebne potrebe, bar isto toliko su značajni i stavovi učesnika u tom procesu. Rezultati rada pokazuju da se nastavnici zalažu za izvođenje inkluzivne nastave, te da je potrebno više pažnje posvetiti mišljenjima, naročito njihovom mijenjanju: kroz razmjenu iskustava, stručno usavršavanje i seminare o inkluziji. S druge strane mogli bi se poboljšati materijalni uslovi u kojima

rade vaspitači i učitelji. Sasvim je sigurno da će još uvijek biti mnogo onih koji u svojim grupama i odjeljenjima ne žele da imaju djecu sa preprekama, odnosno teškoćama ali i da će vaspitno - obrazovne ustanove morati pronaći način kako da postanu dovoljno fleksibilne da bi zadovoljile potrebe svih, bez obzira na deficit u razvoju, socijalni položaj, nacionalna opredjeljenja i drugo.

Literatura

1. *Zbornik radova, U susret integracijama. Pale: Filozofski fakultet Univerziteta u Istočnom Sarajevu, 2005.*
2. *Popadić P. Specijalna pedagogija sa metodikom. Istočno Sarajevo: Filozofski fakultet Univerziteta u Istočnom Sarajevu, 2006.*
3. *Ilić M. Inkluzivna nastava. Filozofski fakultet: Istočno Sarajevo, 2009.*
4. *Tim stručnjaka za inkluzivni pristup odgoju i obrazovanju, Djeca sa posebnim potrebama u mlađim razredima osnovne škole. Sarajevo: Ministarstvo obrazovanja i nauke, 2005.*
5. *Filipović R. Redakcija. Englesko-hrvatski ili srpski rječnik. Zagreb: Školska knjiga, 1990.*
6. *Aleksić D, Spahić A, Kudumović M. Modern School in New Internet Network Environment. Educa journal, 2017; 2(1).*
7. *Branković D, Suzić N, Milijević S, Ilić M, Krneta. Interaktivno učenje. Banja Luka: Ministarstvo prosvjete Republike Srpske, 1999.*
8. *Suzić N. Osobine nastavnika i odnos učenika prema nastavi. Banja Luka: Narodna i univerzitetska biblioteka Petar Kočić, 1995.*
9. *Termiz Dž. Metodologija društvenih nauka. Lukavac: NIK, Grafit, 1994.*
10. *Vukajlović B. Inkluzivno obrazovanje. Banja Luka: IP, Grafid, 2004.*

Corresponding Author
Dragana Aleksic,
Elementary School "Lijesce",
Brod,
Bosnia and Herzegovina,
E-mail: gagalukic86@hotmail.com

Neuroma in continuity after peripheral nerve reconstruction

Salihagic Sanela[1], Muftic Mirsad[2], Memic Zuhra[1]

[1] Clinic for reconstructive and plastic surgery, Clinical University Center Sarajevo, Sarajevo, Bosnia and Herzegovina,
[2] Faculty of Health Studies, University of Sarajevo, Sarajevo, Bosnia and Herzegovina.

Abstract

Introduction: The peripheral nerve injury and reconstruction can result in excessive proliferation and regenaration of the nerve tissue, with formation of two possible types of neuroma, neuroma of the distal stump and neuroma in continuity. Both types of neuroma jeopardize the functional recovery after injury and reparation, with associated painful sensations in places of anatomical localisation. The golden standard for surgical treatment of neuroma is excision combined with nerve transplantation or elongation of the peripheral nerve proximal to the neuroma, in order to eliminate pressure and potential proliferation of nerve and connective tissue.

Patients and methods: We have evaluated the appearance of neuroma in continuity in 60 cases after peripheral nerve reconstruction of the upper and lower extremities, treated on the Clinic for plastic and reconstructive surgery, Clinical University Center Sarajevo, period 2011-2016. We have used two sided Fisher's exact test which can be applied in the cases of small samples, one of the class of exact tests due to significant deviation from the null hypothesis.

Results: Partial discontinuity of peripheral nerves after injury have resulted in the appearance of neuroma in continuity in 1 case from evaluated 7 patients, while neuroma in continuity has been noticed in 3 cases after complete discontinuity of peripheral nerves from 53 estimated patients with nerve injury. No statistical significant correlation has been noted between the extent of peripheral nerve injury and the appearance of neuroma in cotinuity (p=0.3995). Resulting neuroma in continuity after neurorraphy has been evaluated in 1 case, unlike neuroma in continuity after autologous nerve transplantation in 3 cases, with stastically significant correlation between peripheral nerve reconstruction modality and it`s appearance (p=0.0290). The type of etiologic factor of the nerve injury has no influence on the appearance of neuroma in continuity, with no statistically significant correlation (p=0.3791). Also the statistically significant correlation between the timing of the peripheral nerve reconstruction and the type of operative modality with the appearance of this type of neuroma coluld not be proven (p=0.1848).

Conclusion: The type of the peripheral nerve reconstruction has the influence on the appearance of neuroma in continuity. The primary neurorraphy, with exact possibilty of estimation of the extent of peripheral nerve injury, reduces the possibility of unwanted excessive proliferation of nerve tissue and fibroblasts. The autologous nerve transplantation, especially in cases of indications for secondary reconstruction, is potentially associated with intra and perineural scarification and appearance of neuroma. The primary reparation of peripheral nerve, if possible, represents the most optimal modality of reconstruction, depending of extent of nerve injury and the existance of possible associated injuries, with the potential for more successful recovery.

Key words: neuroma in continuity, nerve injury, nerve reconstruction;

Introduction

Neuromas are hyperplastic disorganised proliferation of cells that represent an attempt at nerve regeneration after trauma. They can be classified into terminal and in continuity neuromas; the latter are observed when the nerve stumps are both connected ([1]). A neuroma in continuity is disorganized fibroneural tissue that occurs after a partial nerve injury or after a previous nerve repair in which portion of the nerve are functional, while in other portion is the excessive regeneration. As the attempt at nerve regeneration there is a hyperplastic proliferation of the neural cells, axons,

myelin, Schwann cells and fibroblasts. Unlike terminal neuroma which is most usually localized at the proximal stump of the nerve, neuromas in continuity are formation which connects the two nerve stumps with variable preservation of nerve tissue. Neuromas-in-continuity constitute 60-70% of all peripheral nerve injuries and account in 10% of patients with neonatal brachial plexus palsy ([2]). According to Mackinnon, nerve injuries in continuity belong to the sixth degree nerve injury.

Diagnoses of neuromas in continuity are based on history and clinical palpable, painful, small and firm masses with paresthesia to the pressure. Initiating trigger of the pain seems to be scar adherence around the nerve or lost of nerves motion. Whenever the clinical diagnosis is inconclusive or the other pathology cannot be excluded ultrasound as diagnostic procedure is helpful. As auxiliary methods can be used MRI and EMG for precise localization of neuroma in continuity.

The proper management of neuroma in continuity requires careful preoperative assessment because the surgeon must be careful not to downgrade the patient's function in an attempt the nerve. Although management at the later stage of initial injury with autologous nerve grafting is a gold standard for bridging the larger gapes, an alternative to grafting may be nerve elongation of the nerve proximally to the neuroma which obtain direct tension free suturing. With respect that nerves will regenerate across a short nerve gap through various conduits that must have low antigenicity, availability and biodegradability, vain grafts have been used for bridging distal sensory nerve defects of less than 3cm ([3]). Also synthetic nerve conduit are available for small diameter nerves reconstruction with a gap <3cm or with large diameter nerves with gap<0,5cm ([4]). Surgical procedure is selected after a reasonable period of follow up with minimal functional return.

Collectively termed techniques as molecular neurosurgery represent axonally transported toxine which has been used to make selective destroy specific types of neurons. Potentially useful agents for this type of treatment are wheat germ agglutinins, the toxic lectins, abrin and ricin. These are ribosome inactivating plant protein and this technique worked well in the peripheral nervous system of rats and the therapeutic use of neural targeting strategies will eventually require such understanding ([5]).

The primary aim of these procedures is pain relief and pain can be assessed using the Elliot score which separately evaluates five pain modalities in which patient scores each modality as absent, mild, moderate or severe: spontaneous basal pain, pikes of pain, pressure pain, movement pain and hypersensitivity.

Delayed or incomplete reinnervation of the target organ is closely related to fascicular patterns at the end of the nerve and often do not correspond to fascicular patterns of the nerve graft.

Nerve grafting complicates nerve regeneration by introducing two suture lines which allows the possibility of neuroma in continuity ([6]). The relatively substantial suture material increase the risk of intraneural fibrosis which has negative influence to the nerve regeneration. Covering the nerve with vascularized soft tissue such is pronator quadrates muscular flap can be helpful.

So far, there has not been much evidence that nerve conduits provide a much better functional outcome than autologous nerve grafts in peripheral nerve repair. However, the results, as currently available, indicate that at least comparable results can be obtained by using nerve conduits. The ideal nerve reconstruction technique should be one that eliminates tension at the repair site, permits immediate reconstruction at the time of injury, does not require sacrifice of another functioning nerve, does not create a scar at a site not already injured, does not add appreciable intraoperative time, does not place a foreign material permanently into the body, does not create the potential for chronic nerve entrapment and permits neurobiology to enhance neural regeneration ([7]).

Timing for exploration and possible nerve reconstruction for injuries that are known or very likely to be lesion in continuity have varied from waiting until there has been return of distally sensory or motor function, to relatively early exploration at two or three weeks. Currently recommended practice is to wait until eight to ten weeks ([8]). EMG is technique which measures physiologic reinnervation. Distal musculature function in response to stimulation eater proximal or distal to a lesion in continuity may herald useful clinical recovery by several weeks.

Patients and methods

We have evaluated the appearance of neuroma in continuity in 60 patients after peripheral nerve reconstruction of the upper and lower extremities, treated on the Clinic for reconstructive and plastic surgery, Clinical University Center Sarajevo for the period 2011- 2016., with assessment of the relationship between etiologic factors, the type and the time of the reconstruction, the extent of the peripheral nerve tissue destruction and the appearance of neuroma after reconstruction. We have estimated also the time of nerve reconstruction related to the occurence of neuroma.

Statistical data processing has been carried out through Two sided Fisher's exact test which can be applied in the cases of small samples, as in our research, which can be considered as one of the class of exact tests due to significant deviations from the null hypothesis.

Results

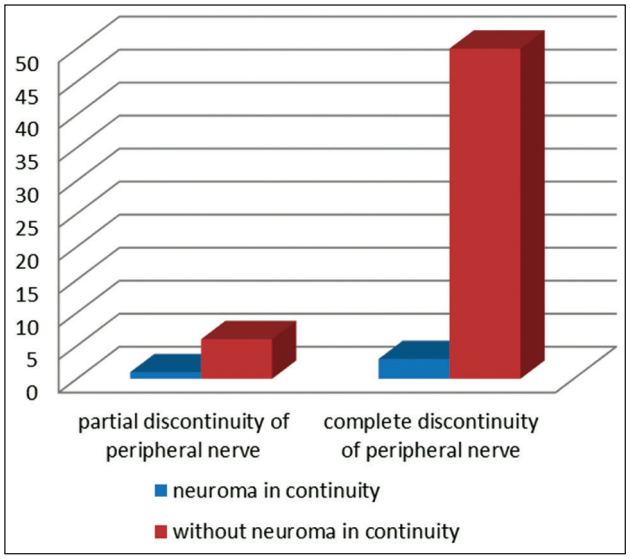


Figure 1. The extent of the peripheral nerve discontinuity

According to the data persented in the Figure 1, in 7 cases of partial discontinuity of peripheral nerves, we have evaluated the appearence of neuroma in continuity in 1 case, while in 6 cases we have reported no neuroma in continuity. Injuries with resulting compete discontinuity of peripheral nerve have been present in 53 cases. Of that number, the occurence of that type of neuroma has been registered in 3 cases. The result of the Two-sided Fisher`s exact test is p=0.3995, with no statistically significant association between the occurence of neuroma in continuity and extensibility of the peripheral nerve destruction during injury.

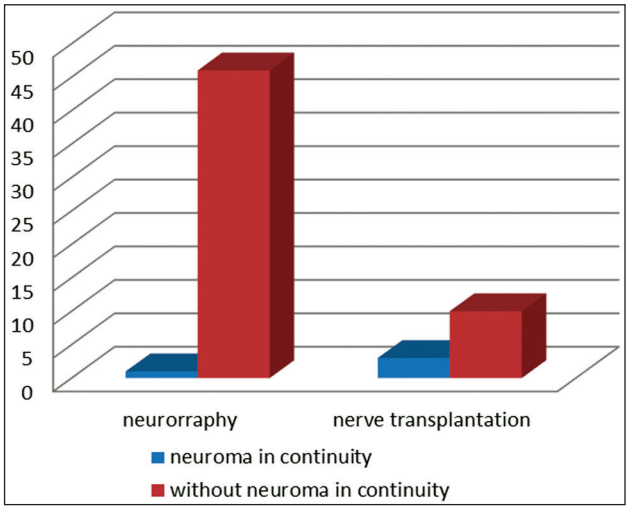


Figure 2. Applied modality of the peripheral nerve reconstruction

The neurorraphy, as one of available modality of the peripheral nerve reconstruction, has been applied in 47 cases, while the autologous nerve transplantation has been applied in 13 cases of the 60 evaluated cases (Figure 2). After neurorraphy, neuroma in continuity has been evaluated only in 1 case, unlike the 3 cases of that type of neuroma after nerve transplantation. The result of the Two-sided Fisher`s exact test is p=0.0290, has proved that had been statistically significant correlation between the peripheral nerve reconstruction modality and the appearance of neuroma in continuity

Many etiologic factors can potentially be causes of peripheral nerve injury, with the different extent of the tissue destruction and and the selected modality of reconstruction (Figure 3). The appearance of neuroma in continuity has been evaluated in 1 case after injury by bone fragments and by the blade of sharp objects. The peripheral nerve injuries with resulting neuroma caused by industrial machines have been evaluated in 2 cases. There is no evidence of neuroma in continuity caused by the other etiologic factors in our study. The result of the Two- sided Fisher exact test is p=0.3791, which has confirmed that there had been no statistically significant correlation between the appearence of neuroma after surgical reparation and the type of etiologic factors of peripheral nerve injuries.

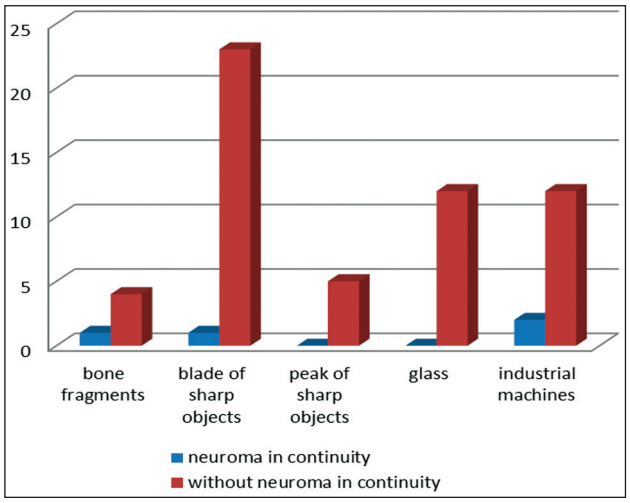


Figure 3. The type of the etiologic factor (the estimated appearance of neuroma in continuity correlated with the type of etiologic factor)

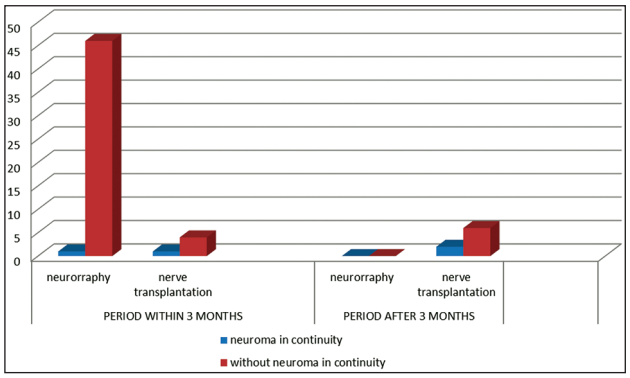


Figure 4. The timing of the peripheral nerve reconstruction

In the our research, the time of the peripheral nerve reconstruction has been divided into 2 periods. The first one, within 3 months after injury, and the second one, after 3 months after injury (Figure 4). Neurorraphy has been applied in 47 cases within 3 months after injury, with resulting neuroma in continuity in 1 case. In the same period, nerve transplantation has been applied in 5 cases, with resulting neuroma in continuity also in 1 case. The result of the Two- sided Fisher`s exact test is p=0.1848, which indicates that there has been no statistically significant correlation between the appearance of neuroma and applied operative modality, during the peripheral nerve reconstruction within 3 months.

Neurorraphy, as selected operative modality, has never been done 3 months after injury. The indication for nerve transplantation has been set in 8 cases, with resulting neuroma in continuity in 2 cases and no possibility of evaluation of Fisher's exact test, because neurorraphy has not been applied in any estimated case in that period. Our data with low frequencies could not be processed by χ-square test due to lack of reliability.

Discussion

We have evaluated 4 cases of neuroma in continuity of 60 estimated postoperative results after peripheral nerve reconstruction.

We have noticed no statistically significant correlation in neuroma in continuity appearance and the extent of peripheral nerve destruction. There is no evidence that the neuroma in continuity had a higher incidence in the cases of complete nerve section. The appearance of neuroma in continuity is associated with the extent of intra and perineural scarification. Data from the literature show that iatrogenic injury of the peripheral nerve can result in the painful neuroma appearance ([9]).

Apparently, the formation of a neuroma in continuity prohibits functional recovery, but the reason for this is poorly understood. Neuroma tissue is characterized by excessive fibrosis, which is generally considered an impediment to axonal regeneration ([10]). The applied operative modalities, neurorraphy and nerve transplantation, have showed a clear correlation with the appearance of neuroma in continuity. The most of the cases of neuroma have been related to nerve transplantation. This can be explained with the higher degree of the peripheral nerve tissue destruction, and also by the placement of sutures during fixation of the nerve transplant, which can act as a factor of the increased proliferation of the nerve tissue and fibroblasts. The appearance of neuroma in continuity has been recorded after autologous nerve transplantation and also allografts had shown subotimal postoperative results after multiple neuroma excisions ([11]).

Resection of both end neuromas and neuromas in continuity using nerve allografts is preferable method ([12]). In our estimated 4 cases of neuroma in continuity we have applied only resection with internal and external neurolysis, with no indication for resection and autologous nerve transplantation.There has been no proved clear correlation between the timing and modality of the nerve reconstruction with the appearance of neuroma during the estimation of the postoperative results of our 60 patients. This could

be explained by the small number of evaluated neuroma in continuity after nerve reconstruction.

Conclusion

The peripheral nerve reconstruction after nerve injury caused by the different etiologic factors, represents the chellenge, considering a number of possible potential complications. Extent of the peripheral nerve discontinuity, state of the surrounding tissue and quality of soft tissue cover determine the selection of operative modality. Neuroma in continuity phenomenon, as a result of the abnormal intra and perineural scarification, colud not be preoperatively predicted. The etiology of neuroma is not clear enough. With a surgical point of view, adequate debridement, careful surgical manipulation without additional damage of nerve structure and well vascularized soft tissue cover may be preventing factors of neuroma formation. Primary nerve reparation, in the case of coreect indication, can reduce the possibility of neuroma formation, due to adequate assessment of extent of nerve injury and state of surrounding tissue.

Our research has proved that the modality of peripheral nerve reconstruction had an infleunce on the neuroma formation. The autologous nerve transplantation, indicated in the case of defects in nerve continuity, is associated with the more extensive surgical manipulation, which can be a trigger of unexpected abnormal tissue proliferation.

The appearance of the any type of neuroma and also propensity to the abnormal proliferation of the nerve tissue and fibroblasts are not predicted preoperatively. There is no clear correlation between the appearance of neuroma and the type of etiologic factors, nor between the extent of the peripheral nerve discontinuity and neuroma formation. The clear correlation has also could not be defined between the timing of reconstruction and the selected operative modality. This leads to the conclusion that neuroma formation could be genetically determined, despite all external factors, which provoke an unexpected tissue proliferation.

References

1. *Allesandrino F, Pagani C, Draghi F. In-continuity neuroma of the median nerve at the elbow. J Ultrasound. 2014 Sep; 17(3): 229-231.*
2. *J Gosk, at al. Neurolysis of the Conducting Neuroma-In-Continuity In Perinatal Brachial Plexus Palsy – Evaluation of the Results of Surgical Treatment. Folia Neuropathol, 2011; 49(3): 197-203.*
3. *Jeudy G, Raimbeau G, Rabarin F, Fouque PA, Saint-Cast Y, Césari B, Bigorre N. Neuroma-in-continuity of the median nerve managed by nerve expansion and direct suture with vein conduit. Orthop Traumatol Surg Res. 2014 Jun; 100 (4 Suppl): S 67-70*
4. *Mavrogenis AF, Pavlakis K, Stamatoukou A, Papagelopoulos A, Theoharis S, Zoubos AB, et al. Current treatment concepts for neuromas -in-Continuity. Injury 2008 Sep; 39 Suppl 3: 43-8.*
5. *Toia F, Giesen T, Giovanolli P, Calcagni M. A systematic review of animal models for experimental neuroma. J Plast Reconstr Aesthet Sugr. 2015 Oct; 68(10): 1447-63.*
6. *Meek MF, Coert JH. Clinical use of nerve conduits in peripheral-nerve repair: review of the literature. J Reconstr Microsurg. 2002; 18(2): 97-109.*
7. *Pitta MC, Wolford LM, Mehra P, Hopkin J. Use of Gore-Tex tubing as a conduit for inferior alveolar and lingual nerve repair: experience with 6 cases. J Oral Maxillofac. Surg.2001 May; 59 (5): 493-6.*
8. *Kline DG. Timing for exploration of nerve lesions and evaluation of the neuroma-in-continuity. Clin Orthop Relat Res. 1982 Mar; (163): 42-9.*
9. *Verweij JP, van Hof KS, Malessy MJ, van Merkesteyn R. Neuropathic Pain Due to Iatrogenic Lingual Nerve Lesion: Nerve Grafting to Reduce Otherwise Untreatable Pain. J Craniofac Surg. 2016 Dec 30.*
10. *Arie C, van Vliet MSc, Tannemaat MR, van Dunien SG, Verhaangen J, Mallesy JA, De Winter F. Neuroma-in-Continuity Contains Focal Deficits in Myelination. J Neuropathol Exp Neurol. 2015 Sep; 74(9): 901-11.*
11. *Sosin M, Weiner LA, Robertson BC, DeJesus RA. Treatment of a Recurrent Neuroma Within Nerve Allograft With Autologous Nerve Reconstruction. Hand (N Y). 2016 Jun; 11(2): NP5-9.*
12. *Souza JM, Purnell CA, Cheesborough JE, Kelikian AS, Dumanian GA. Treatment of Foot and Ankle Neuroma Pain With Processed Nerve Allografts. Foot Ankle Int. 2016 Oct; 37(10): 1098-1105.*

Corresponding Author
Sanela Salihagic,
Clinic for reconstructive and plastic surgery,
Clinical University Center Sarajevo,
Sarajevo,
Bosnia and Herzegovina,
E mail: sanela.salihagic@yahoo.com

Zdravstveni informacioni sistem na primjeru klinike za nuklearnu medicinu KCUS-a

Meliha Ibrisagic

Univerzitetsko klinički centar Sarajevo, Sarajevo, Bosna i Hercegovina.

Sažetak

Osnovna funkcija zdravstvenog sistema je obezbeđenje i ostvarenje zdravstvene zaštite i poboljšanje zdravlja pojedinca, porodice i zajednice.

Informacioni sistemi mogu igrati važnu ulogu u menadžmentu znanja, pomaganjem organizaciji u stvaranju, pohranjivanju, širenju i primjeni znanja, te obuhvatanju osnove tog znanja.

Cilj ovog rada je dati pregled implementacije aplikacija i sistema, te iskustava u radu sa njima, kroz primjer rada sa SAP sistemom, na Klinici za Nuklearnu medicinu Klinickog centra univerziteta u Sarajevu.

SAP program uveden je 2012 i u dosadašnjem radu pokazao je dobre rezultate.

Korisnost ovih sistema ogleda se kroz njihov fokus na podršku informacijama i radnom znanju, te definisanju i uzakonjivanju (kodifikaciji) organizacionih baza znanja. Novo doba zahtijeva i nove organizacije kreativnog znanja koje konkurentske prednosti u uslovima globalizacije stiču u procesu kontinuiranog učenja stvarajući i prikupljajući novo znanje u svim segmentima "lanca vrijednosti". Implementacijom ovakvog informacionog sistema pružili smo kvantitativna poboljšanja (specifični pokazatelji kvaliteta), ekonomske prednosti (kraće bolničko liječenje, manje operativnih troškova) i kvalitativne ciljeve – poput boljih usluga pacijentima i građanima.

Ključne riječi: zdravstvo, informacioni sistem, klinika, usluga, pacijent.

Uvod

Informacioni sistem - predstavlja interakciju ljudi, procedura i informacionih tehnologija potrebnih za izvođenje željenog posla.

Informacione tehnologije - su kombinacija hardverske, softverske i telekomunikacione opreme.

Osnovna funkcija zdravstvenog sistema je obezbeđenje i ostvarenje zdravstvene zaštite i poboljšanje zdravlja pojedinca, porodice i zajednice.

Zdravstvene ustanove, kao i sve druge kompanije imaju potrebu za implementacijom informacionih sistema, te je neophodno organizovati organizacionu jedinicu koja je odgovorna za rukovanje sistemima, kao i za ispravnost hardvera, softvera i drugih tehnologija u okviru sistema. U ovakvoj jedinici, naročito ako je riječ o većoj ustanovi, mogu biti zaposleni specijalisti poput programera, analitičara, vođa projekata te menadžera informacionih sistema. Manje ustanove ili ordinacije mogu imati jedno lice koje bi održavalo mreže funkcionisanje aplikacija ili angažovati konsultanta za takve aktivnosti.

Povezanost zdravstvenog i informaciono tehnološkog razvoja omogućava modeliranje interakcije na makro i mikro nivou i reinženjering zdravstvene djelatnosti. Uloga i značaj razvoja informacionih sistema i primjena informacione tehnologije u zdravstvu u zemljama u tranziciji je vrlo velika. Praćenje ovakvih trendova vode optimizaciji upravljanja i podizanja kvaliteta odlučivanja u zdravstvu.

Menadžment znanja predstavlja komplet procesa za sistematsko i aktivno rukovođenje i uticanje na nivoe znanja u nekoj organizaciji.

Informacioni sistemi mogu igrati važnu ulogu u menadžmentu znanja, pomaganjem organizaciji u stvaranju, pohranjivanju, širenju i primjeni znanja, te obuhvatanju osnove tog znanja.

Sistemi menadžmenta znanja uključuju podršku za "ostave" znanja, mreže znanja i zajedništvo u praksi.

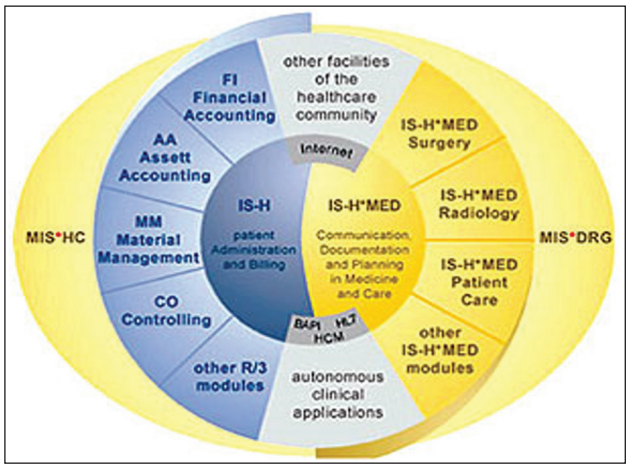
U menadžmentu znanja su posebno korisni uslužni sistemi, radni sistemi znanja (Knowledge Work Systems, KWS), sistemi grupne saradnje, te aplikacije umjetne inteligencije.

Korisnost ovih sistema ogleda se kroz njihov fokus na podršku informacijama i radnom znanju, te definisanju i uzakonjivanju (kodifikaciji) organizacionih baza znanja. Novo doba zahtijeva i nove organizacije kreativnog znanja koje konkurentske prednosti u uslovima globa-lizacije stiču u procesu kontinuiranog učenja stvarajući i priku-

pljajući novo znanje u svim segmentima "lanca vrijednosti".

- Glavni ciljevi sistema zdravstva:
- Jednak pristup svima zdravstvenoj zaštiti
- Kvalitet
- Djelotvornost
- Ekonomičnost
- Zadovoljstvo pacijenata i medicinskih radnika

Definicija Svetske zdravstvene organizacije (SZO) jednostavno objašnjava „Elektronsko zdravstvo je novi termin koji opisuje kombinovane upotrebe elektronske komunikacije i informacione tehnologije u zdravstvenom sektoru".(1,2)



Slika 1. Elementi integriranog poslovno-informacijskog sistema zdravstvenih ustanova

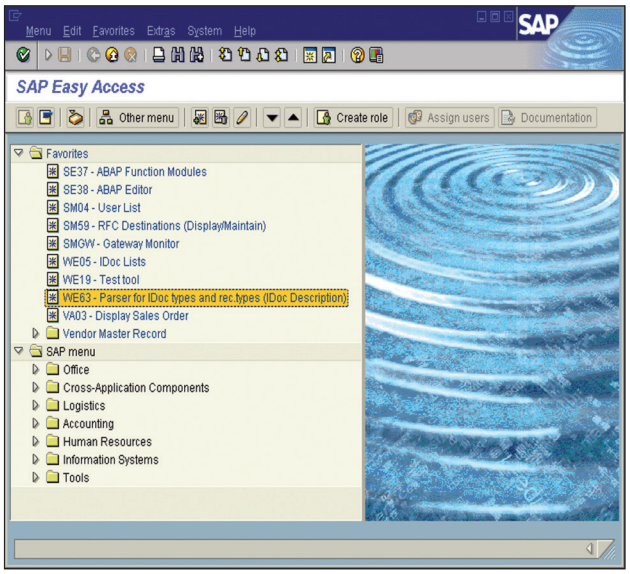
Modernizaciji zdravstva uključuje novi način razmišljanja (npr. veću orijentaciju na pacijente u zdravstvu i veći fokus na upravljanje kvalitetom), organizacione i stimulativne modele, obuku i veštine, infrastrukturu i naravno IT. IT je obavezan radi postizanja transparentosti i integracije administrativnog pogleda u lancu vrijednosti s medicinskim ili kliničkim pogledom i procesima. (3)

Na Klinici za Nuklearnu medicinu Klinickog centra univerziteta u Sarajevu, gdje sam zaposlena i obavljam poslove Više medicinske sestre radim sa SAP programom.

Klinika za nuklearnu medicinu je stručna, naučna i edukaciona institucija KCUS iz oblasti nuklearne medicine.

SAP program uveden je prošle godine i u dosadašnjem radu pokazao je dobre rezultate.

SAP je svetski lider u integrisanju svih dimenzija zdravstvene zaštite – od administrativnih aspekata poput finansija, nabavke, ljudskih resursa ili poslovne inteligencije do medicinskih aspekata poput kliničkih informativnih sistema ili zdravstvenih usluga preko telekomunikacione tehnologije.



Slika 2. SAP dokument

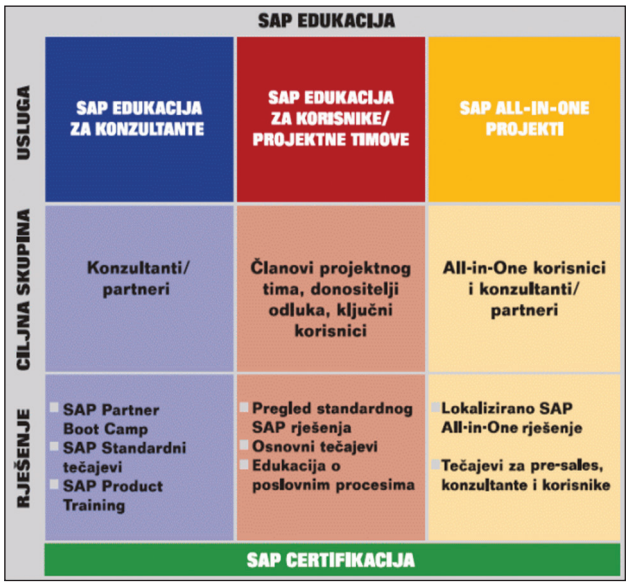
U današnjem visoko konkurentnom poslovnom svijetu, osobe obučene osnovnim poslovnim i tehnološkim vještinama uživaju značajnu prednost. To je naročito izraženo kada struka kojom se bavite ili tvrtka čiji ste zaposlenik, koristi SAP-ov sustav. Dokaz znanja o korištenju SAP-ovih aplikacija i tehnologija otvara širok spektar mogućnosti u osobnom i profesionalnom razvoju. (3,4)

Upravo **edukacija za krajnje korisnike** (postojeći korisnici SAP-ovog sustava te osobe bez predznanja o SAP-ovom sustavu) osigurava zaposlenicima osnaživanje karijere i mogućnost napredovanja, uštedu vremena i bolju organizaciju svakodnevnih obAveza te diferencirane konkurentske prednosti. S druge strane, certificirani stručnjaci tvrtkama će omogućiti brzu prilagodbu promjenama, povećanje kvalitete pružanja usluga, kvalificirane ljudske potencijale te mogućnost rada na budućim implementacijskim projektima.

Implementacijom ovakvog informacionog sistema pružili smo kvantitativna poboljšanja (specifični pokazatelji kvaliteta), ekonomske prednosti (kraće bolničko liječenje, manje operativnih troškova) i kvalitativne ciljeve – poput boljih usluga pacijentima i građanima.

SAP for Healthcare je poslovno rješenje koje povećava produktivnost i organizacijske vrijed-

nosti kako bi se djelatnici u zdravstvu posvećivali brizi za pacijente.



Slika 3. SAP edukacija (3,4,5)

Snaga Interneta danas osigurava brzo, pravodobno i pravilno integriranje s poslovnim procesima osiguravajući usmjerenost na ispunjavanje svoje svrhe - pružanje zdravstvene brige.

Objedinjujući sve segmente zdravstvenih procesa, SAP for Healthcare rješenje, između ostaloga donosi:

- Pojednostavnjenje vaše administracije i financijskih procesa.
- Snižava troškove zahvaljući bržem računovodstvenom sustavu i ciklusu naplate i potraživanja, te povećava efikanost ljudskih potencijala.
- Kreira i osigurava bolje radne uvjete.
- Povećava brigu za pacijente i njihovo zadovoljstvo brigom i tretmanom skrojenim upravo za njihove potrebe.
- Povećava kolaborativnost poslovnih procesa u zdravstvu integrirajući cikličke poslovne procese s aspekta medicinskog osoblja, druge pružatelje medicinske zaštite, klinika, pružateljima medicinskih usluga i dobavljačima medicinske opreme.
- Poboljšava odnos s pacijentima, osigurava efikasnije upravljanje pacijentovim boravkom u ustanovi, kao i brigu za pacijenta nakon izlaska iz nje.(5,6,7)

Zaključak

SAP BusinessObjects je vodeći svjetski proizvođač *Business Intelliegence* tehnologije i rješenja koji je počeo još u pionirsko doba *Business Intelliegencea* i vremenom je snažno utjecao na promjenu načina rada upravo uz pomoć informacija.

Kombinirajući inovativnu tehnologiju, globalni konzalting, i edukacijske servise, a uz pomoć najrazvijenije *Business Intelliegence* mreže partnera, omogućavao je korisnicima bez obzira na njihovu veličinu da unaprijede poslovno odlučivanje, a time i svoje poslovne procese.

Implementacijom ovakvog informacionog sistema pružili smo kvantitativna poboljšanja (specifični pokazatelji kvaliteta), ekonomske prednosti (kraće bolničko liječenje, manje operativnih troškova) i kvalitativne ciljeve – poput boljih usluga pacijentima i građanima.

Na Klinici za Nuklearnu medicinu Klinickog centra univerziteta u Sarajevu, trenuto radimo samo SAP-ov administrativni aspekt finansija.

Ovakav informacioni sistema pružio nam je velike prednosti, manje opeativne troškove i bolje usluge pacijetima.

U današnjem visoko konkurentnom poslovnom svijetu, osobe obučene osnovnim poslovnim i tehnološkim vještinama uživaju značajnu prednost. To je naročito izraženo kada struka kojom se bavite ili tvrtka čiji ste zaposlenik, koristi SAP-ov sustav. Dokaz znanja o korištenju SAP-ovih aplikacija i tehnologija otvara širok spektar mogućnosti u osobnom i profesionalnom razvoju.

SAP for Healthcare je poslovno rješenje koje povećava produktivnost i organizacijske vrijednosti kako bi se djelatnici u zdravstvu posvećivali brizi za pacijente. (7,8)

U budućnosti Klinika za Nuklearnu medicinu KCUSA, pokraj ostvarenih operatinih prednosti SAP-ovih aplikacija i tehnologija, za bolje povećanje produktivnosti i organizacijeske vrijednosti u profesionalnom razvoju potebno je uključiti široki spektra mogućsnosti SAP-ovih aplikacija i tehnologija, kako bi se pružilo kvantitativno poboljšanje, ekonomska prednost i kvantitativni ciljevi, za što bolje usluge pacijentima.

Literatura

1. *Mediks, specijalizirani medicinski dvomjesečnik, mr.sc. Ivica Pale, dipl.ing., Zagreb.*
2. *Kudumovic M, Kudumovic D, Mesanovic N, Huremovic E. Modern Information Comunication Technologies and educational technologies applied to education of medicine, HEALTHMED, 2010; 4(1): 158-162.*
3. *www.education.croatia@sap.com.*
4. *www.infotrend.s3.novenaweb.info/clanak/2009/4/kva.*
5. *www.wifi-croatia.com/wifi.cfm?pid=520*
6. *National Information Strategy – Health in UK, 2000.*
7. *SAP AG; "SAP e-Healthcare*

Corresponding Author
Meliha Ibrisagic
Univerzitetsko klinički centar Sarajevo,
Sarajevo,
Bosna i Hercegovina,
E-mail: balkanjournal@yahoo.com

Disfunkcija štitne žlijezde u pacijenata sa Diabetes Mellitus-om

Amina Jaganjac

Centar za zdravo starenje, Sarajevo, Bosna i Hercegovina.

Sažetak

Disfunkcije štitne žlijezde predstavljaju odstupanja u njenoj funkcionoj aktivnosti izvan granica fizioloških kolebanja .

Oboljenja štitne žlijezde su u općoj populaciji zastupljena sa 6,6%. Obolijevanju je skloniji ženski dio populacije a učestalost raste sa životnom dobi te su najučestalija u populaciji starijoj od 65 godina.

Diabetes mellitus, masovna je hronična nezarazna bolest od koje u svijetu boluje oko 190 miliona ljudi a procjenjuje se da će do 2025 broj oboljelih porasti do 300 miliona.Izaziva značajne akutne i hronične komplikacije neadekvatno kontrolisana, uplitanje u tireoidnu osovinu. Značajno učestalije javljanje oboljenja štitne žlijezde kod dijabetičara, za razliku od ostale populacije,

Cilj istraživanja bio je prikazati procentualnu zastupljenost pacijenata sa disfunkcijom štitne žlijezde u populaciji oboljelih od diabetes mellitusa na Klinici za endokrinologiju, dijabetes i bolesti metabolizma u Sarajevu, prosječno u jednoj godini.

Analizirano je 65 pacijenata oboljelih od diabetes mellitus-a a kod kojih je utvrđena disfunkcija štitne žlijezde.

Disfunkcija štitne žlijezde je ustanovljena kod 14,2% pacijenata oboljelih od diabetes mellitus-a na Klinici za endokrinologiju, dijabetes i bolesti metabolizma za period od 12 mjeseci.

Ključne riječi: Disfunkcije, žlijezde, štitna, Hipertireoidizam, Diabetes mellitus,

Uvod

Promjena nivoa hormona u plazmi dovodi do povećanja ili smanjenja oksidativnih procesa u ćelijama, te samim tim do povećanog ili smanjenog iskorištavanja ugljikohidrata, proteina i masti i promjena njihovog metabolizma.

Postojanje disfunkcije štitne žlijezde kod oboljelih od diabetes mellitus-a, sindroma u kome postoji sistemski poremećaj metabolizma ugljikohidrata, masti i proteina zbog apsolutnog ili relativnog nedostatka biološki aktivnog inzulina a sa posljedičnom hiperglikemijom koja dovodi do pojave hroničnih komplikacija na malim i velikim krvnim žilama, živcima te bazalnim membranama različitih tkiva, dodatno usložnjava postojeće oboljenje. Prvenstveno je otežana kontrola nivoa glikemije te su moguće komplikacije izazvane njenim promjenama.Metabolizam masti je dodatno usložen, mogući razvoj dislipidemije vodi ka nastanku kardiovaskularnih oboljenja i smrtnom ishodu.Diabetes uzrokovan autoimunom komponentom može biti praćen razvojem oboljenja štitne žlijezde takođa autoimunog karaktera u kasnijem periodu života (1, 2, 3, 5).

Značajno učestalije javljanje oboljenja štitne žlijezde kod dijabetičara, za razliku od ostale populacije, te porast obolijevanja sve mlađeg dijela stanovništva od tipa 2 ukazuje na očekivanje i učestalijeg javljanja kardiovaskularnih komplikacija uzrokovanih postojanjem ova dva poremećaja (6, 7, 8).

Postojanje disfunkcije štitne žlijezde utječe na kontrolu dijabetesa. Hipertireoidizam je povezan sa pogoršanjem kontrole nivoa glikemije i povećane potrebe za inzulinom.Poremećaj se temelji na povećanoj glukoneogenezi u jetri, ubrzanju absorpcije glukoze u gastrointestinalnom traktu i, vjerovatno, pojačanoj inzulinskoj rezistenciji.Tireotoksikoza može razotkriti latentni dijabetes.U praksi postoji nekoliko implikacija za pacijente sa dijabetesom i hipertireoidizmom.

U hipotireoidizmu postoje široke mogućnosti promjena u metabolizmu karbohidrata ali su kliničke manifestacije ove abnormalnosti rijetko očigledne.Smanjena razgradnja inzulina može smanjiti egzogeni nadomještaj istim.Postojanje hipoglikemije je neuobičajeno rijetko kod izolirane deficijencije tireoidnih hormona i treba potaknuti mogućnost postojanja hipopituitarizma u oboljelih od hipotireoidizma.Veća je mogućnost javljanja hipotireoidizma s nenormalnostima lipida u

plazmi uključujući povećanje nivoa koncentracije triglicerida i holesterola niske gustoće (LDL). Čak i subklinički hipotireoidizam može pogoršati koegzistenciju dislipisemije zajednički nađene sa DM 2 i dodatno povećati rizik od kardiovaskularnih bolesti.Adekvatna nadoknada tiroksina će poništiti poremećaje lipida(5,12,14).

Ciljevi i zadaci

Ustanoviti ukupan broj i procentualnu zastupljenost pacijenata sa disfunkcijom štitne žlijezde u populaciji oboljelih od diabetes mellitusa na Klinici za endokrinologiju, dijabetes i bolesti metabolizma u Sarajevu, pratiti bazalne karakteristike populacije uključene u ispitivanje : dobnu strukturu, spol, trajanje diabetes mellitusa, vrstu ranije uključene terapije za liječenje diabetes mellitusa i disfunkciju štitne žlijezde i utvrditi prosječne vrijednosti bazalnih karakteristika populacije i laboratorijskih parametara.

Ispitanici i metode

Studija je klinička i retrospektivna.U ispitivanju se utvrdila zastupljenost disfunkcija štitne žlijezde u populaciji oboljeloj od diabetes mellitus-a.Pratile su se bazalne karakteristike populacije uključene u ispitivanje: dobna struktura, spol, trajanje diabetes mellitus-a, vrsta ranije uključene terapije za liječenje diabetes mellitus-a i disfunkcija štitne žlijezde.

U studiju je uključeno 65 pacijenata oboljelih od diabetes mellitus-a a kod kojih je utvrđena disfunkcija štitne žlijezde sa kompletnim laboratorijskim nalazima i anamnestičkim podacima, liječenih na Klinici za endokrinologiju, dijabetes i bolesti metabolizma u Sarajevu. Od ukupno 78, ostali su isključeni iz statističke obrade radi nepotpunih podataka. Starost ispitanika je od 23 do 87 godina, prosjek 63,1 godina.

Na osnovu prikupljenih podataka izvršena je statistička obrada u programu Microsoft Excell, kako bi se utvrdio ukupan broj pacijenata sa disfunkcijom štitne žlijezde u populaciji oboljeloj od diabetes mellitus-a na Klinici za endokrinologiju, dijabetes i bolesti metabolizma u Sarajevu za period od 12 mjesec.

Rezultati

Najzastupljenija dobna skupina među oboljelim od diabetes mellitus-a sa disfunkcijom štitnjače je ona iznad 65 godina sa 55%. Prosječna starost oboljelih je 63,1 godina.

Među oboljelim od diabetes mellitus-a sa disfunkcijom štitnjače najveći procenat (56,9%) zauzimaju dugogodišnji dijabetičari kod kojih bolest traje 6 i više godina.Potom sa 26,2% slijede oni koji boluju od dijabetesa do 5 godina a najmanji je procenat (16,9%) oboljelih sa trajanjem bolesti do mjesec dana.

S obzirom na spol, veliku većinu oboljelih od diabetes mellitus-a sa disfunkcijom štitnjače liječenih na Klinici za endokrinologiju, dijabetes i bolesti metabolizma čine žene (83%) dok su muškarci zastupljeni u malom procentu (17%).

Prema vidu disfunkcije štitne žlijezde u našoj studiji najzastupljenija su tumorozna i ostala stanja sa 49,2%, hipotireoza je na drugom mjestu sa 43% i hipertireoza sa 7,7% što nije u skladu sa Wu, gdje je hipotireoza najčešća kod 31% .

Vrijednosti glikemije na tašte su u našoj studiji povišene u vrlo visokim procentima kod sva tri vida poremećaja i to 93% kod hipotireoze, 80% hipertireoze i 96% kod tumora i ostalih stanja.

Glikozilirani hemoglobin (HbA1c) kod naših ispitanika takođe pokazuje povišene vrijednosti kod sva tri vida i to kod hipotireoze 79%, hiperti-

Tabela 1. Vrijednosti glikemije na tašte

Vrijednosti glikemije	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
Hiperglikemija	26	4	30
Normoglikemija	2	1	2

Tabela 2. Vrijednosti HbA1c

Vrijednost HbA1c	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
7,0 <	22	3	28
7,0 >	6	2	4

reoze 60% i tumora i ostalih stanja 87% što nalaze i Žmire i ostali a predstavlja posljedicu povišenih vrijednosti glikemije na tašte.

Vrijednost holesterola je kod oboljelih od diabetes mellitus-a sa hipotireozom je kod 64% u okviru referentnih vrijednosti, u 25% je povišena a 11% ima snižene, prosječna je 5,3.

Vrijednost triglicerida je kod oboljelih sa hipotireozom je u 57% povišena a 43% ima referentne vrijednosti, prosječna je 3,98 mmol/l.

Prema vrijednosti BMI oboljeli od diabetes mellitusa-a sa hipotireozom su 39% debeli, 32% ima prekomjernu tjelesnu težinu, sa normalnom tjelesnom težinom je 25% a 4% je mršavo, prosječna je 28.

Vrijednosti krvnog pritiska kod oboljelih od diabetes mellitus-a sa disfunkcijom štitne žlijezde u obliku hipotireoze su većinom normalne (57%), manji procenat (36%) ima povišene a samo kod 3% su snižene.

Disfunkcije štitne žlijezde u populaciji oboljelih od diabetes mellitus-a učestalije su nego u općoj populaciji prema istraživanjima u velikim svjetskim studijama (4,5,7,8). Diabetes mellitus tip1 svojom autoimunom etiologijom često dovodi do razvoja oboljenja štitne žlijezde takođe autoimune etiologije kod iste osobe te kod srodnika u prvoj liniji (13,16). Kao i u općoj populaciji češće obolijevaju osobe ženskog spola i učestalost raste sa godinama starosti ali je kod dijabetesa bitan faktor još i dužina trajanja bolesti koja povećava prevalencu Za diabetes mellitus tip 2 takođe je karakteristična veća učestalost nego u općoj populaciji ali je u posljednjim istraživanjima utvrđena i povećana prisutnost autoimunih antitijela što je otvorilo pitanje masovnog skrininga i te populacije i njegove isplativosti (6,7,9). Uopće, vlada nesklad u preporukama sistematskog skrininga disfunkcije štitne žlijezde od krovnih organizacija, ali se može uzeti da se godišnji skrining preporučuje kod oboljelih od DM tip 1 a svakih pet godina kod muškaraca i žena starijih od 35 godina sa DM tipom 2 što omogućava praćenje razvoja bolesti , pravovremeno uspostavljanje dijagnoze, primjena odgovarajuće terapije i sprječavanje razvoja komplikacija (5,9,10).

Tabela 3. Vrijednosti holesterola

Lab. vrijednosti	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
6,5 mmol/l<	7	0	4
3,1 - 6,5mmol/l	18	4	25
3,1 mmol/l >	3	1	3

Tabela 4. Vrijednosti triglicerida

Lab. Vrijednosti	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
1,9 mmol/l<	16	5	15
0,11 - 1,9mmol/l	12	0	17

Tabela 5. BMI

Vrijednosti	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
30 kg/m	11	0	7
25 - 29,9	9	4	15
18,5 - 24,9	7	1	9
18,5 >	1	0	1

Tabela 6. Vrijednosti krvnog pritiska

Vrijednosti RR	Hypothyreosis	Hyperthyreosis	Tumori i ostala stanja
povišen	10	3	22
normalan	16	2	9
snižen	2	0	1

Zaključci

U našoj studiji utvrdili smo procentualnu zastupljenost od 14,2% disfunkcije štitne žlijezde u populaciji oboljeloj od diabetes mellitus-a na Klinici za endokrinologiju, dijabetes i bolesti metabolizma za period od 12 mjeseci.

U našem istraživanju obavljenom na Klinici za endokrinologiju, dijabetes i bolesti metabolizma od 551 hospitalizovanog pacijenta sa dijagnozom diabetes mellitus-a kod 78 postojalo je još i oboljenje štitne žlijezde, procentualno to je 14,2% te populacije.Oboljeli od diabetes mellitus-a sa disfunkcijom štitne žlijezde su najvećim dijelom starije životne dobi, iznad 65 godina, 35 (53,8%), nešto maji broj 21 je starosti 45 do 65 godina a najmanji dio, 9 je dobi od 18 do 4, prosječna starost je 63,1 godina. Izrazito više obolijeva ženski dio populacije čak 83%.

Literatura

1. *Report of the expert committe on the diagnosis and classification of diabetes mellitus.Diabetes Care 2003; 26(1): 5-20.*
2. *Heljić B i saradnici.Diabetes mellitus, klinički aspekti. Jež 2002; 13-111.*
3. *Cannaris GJ, Manowitz NR, Mayor G, Ridgway EC.The Colorado Thyroid Disease Prevalence Study. Arch Intern Med 2000; 160: 526-534.*
4. *Wu Patricia.Thyroid disease and diabetes.Clinical Diabetes 2000; 18(1): 38-40.*
5. *Radaideh AR, Nuseir MK, Amari FL, Baleiha AE, El-Khateeb MS, Naser AS, et al. Thyroid dysfunction in patients with type 2 diabetes mellitus in Jordan. Saudi Medical Journal 2004; 25(8): 1046-50.*
6. *Perros P, Mc Crimmon R, Shaw G, Frier B. Frequency of thyroid disfunction in diabetic patients : value of annual screening.Diabet Med 1995; 622-627.*
7. *Turnbridge WMG, Evered DC, Hall R, Appleton D, Brevis M, Clarck F.The spectrum of thyroid disease in the community : the Wickham survey.Clin Endocrinolo 1997; 7: 481-493.*
8. *Badman MK and Chowdhury TA.Should thyroid function tests be done annualy in all patients with diabetes?Diabet Med 2002; 19: 1-18.*
9. *American Diabetes Association.American Diabetes Association: Clinical practice reccomendations.Diabetes Care 1998; 21.*
10. *Harrison. Principi interne medicine. Placebo 1997.*
11. *Johnson LJ. Diabetes Control in Thyroid Disease. Diabetes Spectrum 2006; 199(39): 148-153.*
12. *Gonzales CG, Capel I, Rodrigez-Espinoza J. Thyroid Autoimunity at Onset of Type 1 Diabetes as a Predictor of Thyroid Dysfunction.Diabetes Care 2007; 30(6): 1611-12.*
13. *Ober K. Polyendocrine syndromes. In Medical Managment of Diabetes Mellitus.Leahy J, Clarck, Caffau W, Eds. New York, Marcel Dekker, Inc. 2000; 699-717.*
14. *Akbar DH, Ahmed MM, Al-Mughales J.Thyroid dysfunction and thyroid autoimmunity in Saudi type 2 diabetics.Acta Diabetologica 2006; 43(1): 14-18.*
15. *Umpierrez EG, Kashif AL, Murphy MB, Lamberth CH, Stentz F, Bush A, et al. Thyroid Dysfunction in Patients with Type 1 Diabetes.Diabetes Care 2003; 26(4): 1181-1185.*

Corresponding Author
Amina Jaganjac,
Centar za zdravo starenje,
Sarajevo,
Bosna i Hercegovina,
E-mail: balkanjournal@yahoo.com

„Alati“ koji mogu pomoći u procjeni kvalitete života osoba sa osteoporozom

Mirsad Muftic[1], Slavica Jankovic[2], Barbara Duspara[2], Sanela Salihagic[3]

[1] Fakultet zdravstvenih studija, Univerzitet Sarajevo, Sarajevo, Bosna i Hercegovina,
[2] Veleučilište Lavoslav Ružička, Vukovar, Hrvatska,
[3] Klinika za rekonstruktivnu i plastičnu hirurgiju, Univerzitetski Klinički Centar Sarajevo, Sarajevo, Bosna i Hercegovina.

Uvod

Osteoporoza je metabolička reumatska razarajuća bolest koštanog sustava koju obilježava smanjena koštana masa i promjene u mikroarhitektonskoj građi kosti (1). Prema Svjetskoj zdravstvenoj organizaciji, kako bi se dijagnosticirala osteoporoza potrebno je smanjenje mineralne gustoće kostiju za više od 2, 5 standardne devijacije u odnosu na zdravu mladu populaciju, te je određena denzitometrija kao jedina metoda za dijagnosticiranje i praćenje tijeka liječenja. Osteoporoza s razlogom je opisana kao „tiha epidemija“ i „tihi kradljivac kostiju“ jer nastupa podmuklo, bez simptoma (2). Sam gubitak koštane mase započinje puno ranije (obično dvadesetak godina) od pojave kliničkih simptoma (3). Kao bolest najčešće je difuzno rasprostranjena, a specifične lokalizacije prijeloma su ručni zglob, kralješnica i vrat bedrene kosti (4). O veličini problema osteoporoze govore podaci iz 2002. godine koji pokazuju da je u Americi tada kod 10 milijuna građana dijagnosticirana osteoporoza, a kod 33,6 milijuna dijagnosticirana je osteopenija kuka, dok je u Velikoj Britaniji u dobi od pedeset godina od osteoporoze bolovala jedna trećina žena i jedna dvanaestina muškaraca (5). U Republici Hrvatskoj ne postoji registar oboljelih od osteoporoze, kao ni registar prijeloma kod osoba sa osteoporozom. Međutim, u studiji koja je obradila 6000 osoba u starosti od 20 do 70 godina sudjelovali su ispitanici iz Hrvatske uz ispitanike iz 13 zemalja te je utvrđeno da ispitanici iz Hrvatske imaju sličnu koštanu masu kao i ispitanici europskih zemalja. Procjenjuje se da u Hrvatskoj 90 000 muškaraca i 77 000 žena ima prijelome kralježnice nakon 55 godine života (6). Prema istraživanjima, najčešći faktori rizika za nastanak osteoporoze su starija životna dob, niska mineralna gustoća kostiju te postojanje prethodne frakture (7). Svjetska zdravstvena organizacija navela je još neke predisponirajuće čimbenike kao što su: ženski spol, pozitivna obiteljska anamneza na frakturu kuka, rana menopauza, sekundarna osteoporoza, pušenje cigareta i svakodnevni unos alkohola u organizam (8). Prepoznat je velik broj kliničkih čimbenika rizika koji upućuju na mogućnost prijeloma neovisno o mineralnoj gustoći kostiju koja se navodi kao siguran pokazatelj osteoporoze (9). Jedan od tih čimbenika je nizak indeks tjelesne mase koji je dokazano ključan faktor u nastanku osteoporoze (10). U zdravoj populaciji, mineralna gustoća kostiju razvija se tijekom djetinjstva i adolescencije ka postizanju svog vrhunca u ranoj odrasloj dobi. Prosječno u dobi od 30-45 godina mineralna gustoća kostiju se smanjuje (11).

Padovi i ozljede uzrokovane padovima, poput fraktura, rastući su problem u ljudi treće životne dobi te uzrokuju bol, funkcionalna onesposobljenja, umanjuju kvalitetu života, stvaraju višak troškova zdravstvene skrbi i uzrokuju mortalitet (12). Istražujući troškove saniranja posljedica prijeloma kuka i kralježaka u SAD u tijekom 2005. godine potrošeno je oko 19 milijardi dolara, a do 2025. se očekuju troškovi od oko 25, 3 milijarde dolara (13). Najučinkovitiji način liječenja osteoporoze je zapravo rad na samoj prevenciji od rane mladosti. Brojne studije pokazuju ukoliko osoba vježba te uz prehranu obogaćenu kalcijem, ima znatno maniji rizik od nastanka osteoporoze i prijeloma, što se smatra i najučinkovitijim načinom prevencije (14). Unatoč primarnoj osteoporozi koja čini gotovo 95 % oblika osteoporoze, osteoporoza uzrokovana glukokortikoidima najčešći je oblik sekundarne osteoporoze te se, unatoč prijašnjim uvjerenjima, danas zna da se ona može razviti bez obzira na način primjene glukokortikoida (15).

Glukokortikoidna osteoporoza nastaje unutar nekoliko mjeseci primjene glukokortikoida te više zahvaća spužvastu nego kortikalnu kost (16). Poznavanjem same biologije kosti i funkcije osteoblasta i osteoklasta dolazi se do novih terapijskih ciljeva i strategija kako inhibirati prekomjernu resorpciju kosti i povećati formaciju kosti (17).

Kvaliteta života osoba sa osteoporozom

Pojam kvaliteta života datira još iz doba Aristotela i Platona, a njime se obično nastoje opisati čimbenici koji mogu biti u direktnoj i indirektnoj povezanosti sa pojedincem ili skupinom ljudi. Najčešće se kvaliteta života proučava u smislu zdravstvenog, ekonomskog i socijalnog blagostanja, te se u tu svrhu koriste različiti testovi i upitnici.

Osteoporozu sve češće nazivaju „tihom epidemijom“, a razlog tomu jest činjenica da je kao bolest učestala u pojavljivanju u osoba oba spola već nakon 50-te godine života. Nekada je bila bolest starih osoba i incidencija pojavljivanja je bila u korelaciji sa dobi. Međutim suvremeni način življenja donio je i promjene u pojavi osteoporoze. Brojna istraživanja svjetskih stručnjaka ukazuju kako već nakon četrdesete godine života dolazi do neravnoteže u radu osteoblasta i osteoklasta, te da osteoklasti dolaze u prednost u vidu brže razgradnje kosti, dok s druge strane osteoblasti ne uspijevaju tom brzinom izgrađivati kost (18). Ti prvi počeci - faza brzog koštanog gubitka traje oko 5 godina, a prisutan je gubitak koštane mase do tri posto godišnje u području kralježnice (19). U tom početnom periodu najčešće pacijentice ne osjećaju nikakve simptome, dok će pred kraj prve faze počinju osjećati bolove u leđima, otežani su pokreti, primjećuju se promjene u samoj posturi, te počinju uočavati da im se smanjuje tjelesna visina. U drugoj fazi se sporije gubi koštana masa oko 0,5 % godišnje ali se primjećuje gubitak na svim dijelovima skeleta (20). Ponekad prođe i desetak godina prije nego pacijenti saznaju kako imaju smanjenu koštanu masu u vidu osteopenije/osteoporoze (21).Također nije rijetkost da osoba doživi prijelom, te se tek tada dijagnostičkom obradom pacijenta utvrdi da je prijelom nastupio zbog osteoporoze. S obzirom da je WHO posvetila cijelo desetljeće borbi protiv osteoporoze u tom periodu pojavili su se brojni upitnici i testovi pomoću kojih se nastojala uz uobičajene dijagnostičke i laboratorijske postupke upotpuniti slika o pacijentu sa osteoporozom, te utvrditi kakva je kvaliteta njegovog života. Upitnici koji se najčešće primjenjuju u Europi i svijetu su: 1) the Women's Health Questionnaire, 2) Osteoporosis Quality of Life Questionnaire, 3) OsteoporosisAssessment Questionnaire, 4) Osteoporosis Functional Disability Questionnaire, 5) Quality of Life Questionnaire of the European Foundation for Osteoporosis, 6) Osteoporosis-Targeted Quality of Life Questionnaire, 7) Japanese Osteoporosis Quality of Life Questionnaire, 8) the 16-item Assessment of Health-Related Quality of Life in Osteoporosis, and 9) the Quality of Life Questionnaire in Osteoporosis (QUALIOSTTM), 10) The Fracture Risk Assessment Tool (FRAX) (22).

Women's Health Questionnaire (WHQ) upitnik je koji ima široku primjenu za procjenu kvalitete života žena u menopauzi i periodu nakon menopauze jer pokazuje povezanost promjena estrogena na simptome koje osjećaju žene u tom periodu života (23).

Osteoporosis Quality of Life Questionnaire je upitnik kojim se kroz dvadeset minuta dobiju informacije o kvaliteti života ispitanika iz pet kategorija. Upitnikom su obuhvaćena pitanja o prisutnosti simptoma, poput boli, umora i slično; pitanja o tjelesnom funkcioniranju, o emotivnom stanju, načinu provođenja svakodnevnih aktivnosti i slobodnog vremena (24).

Mini Osteoporosis Quality of Life Questionnaire (mini-QQLQ) je skraćena verzija QQLQ upitnika koja sadrži iste kategorije sa smanjenim brojem pitanja. Ovaj upitnik sadrži samo 10 pitanja te je u kliničkoj praksi vrlo pogodan jer ne iziskuje previše vremena, a daje informacije o kvaliteti života osoba sa osteoporozom (25).

Osteoporosis Assessment Questionnaire (OPAQ) upitnik je kojim se procjenjuje kvaliteta života ispitanica sa osteoporozom u menopauzi i u postmenopauzi, sa ili bez prijeloma. Upitnik je vrlo opsežan, sadrži velik broj pitanja koja su podijeljena u 18 kategorija, a one opet u četiri domene; tjelesno funkcioniranje, psihičko stanje, prisutne simptome i socijalno stanje (26).

Osteoporosis Functional Disability Questionnaire (OFDQ) upitnik je kojim se ispituje kvaliteta života osoba sa osteoporozom koje su imale kompresijske prijelome kralježnice. Upitnik sadrži 59 pitanja raspoređenih u pet područja. Pitanja

se odnose na bol, depresiju, tjelesno funkcioniranje, društvene aktivnosti i prijedloge i preporuke o kvaliteti liječenja i rehabilitacije. Na osnovu odgovora mogu se dobiti kvalitetne informacije o učinkovitosti rehabilitacijskog programa (27).

41-item Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO-41) upitnik je kojim se ispituje kvaliteta života osoba sa osteoporozom koji su imali prijelome kralježaka. Sadrži 41 pitanje podijeljeno u pet kategorija; bol, tjelesno funkcioniranje, socijalnu komponentu, mentalno zdravlje, opći dojam o vlastitom zdravlju (28).

31-item Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO-31) skraćena je verzija upitnika QUALEFFO-41. Ovaj upitnik sadrži tri domene pitanja; bol, mentalno zdravlje i tjelesno funkcioniranje, te na taj način kraći je vremenski za ispunjavanje (29).

16-item Assessment of Health-Related Quality of Life in Osteoporosis (ECOS-16) kratak je upitnik koji se sastoji od kombinacije pitanja dva upitnika kvalitete života ispitanica sa osteoporozom. Sadrži 16 pitanja od kojih su četiri iz QQLQ i 12 iz QUALEFFO. Pitanja su kategorizirana u četiri skupine; bol, strah od bolesti, tjelesne funkcije i psihosocijalni status (30).

Quality of Life Questionnaire in Osteoporosis upitnik je kvalitete života podijeljen na kategorije pitanja koja se odnose na: sliku o sebi, strah od bolesti i budućnosti, blagostanje, mobilnost, bol, mentalno zdravlje. Primjenjuje se također u procjeni stanja osoba nakon prijeloma kralježaka (31).

The Fracture Risk Assessment Tool (FRAX) upitnik je jednostavan upitnik koji se popunjava u elektronskom obliku, te se unošenjem podataka od pacijenata kompjutorski izvrši izračun rizika od prijeloma u području vrata bedrene kosti. Upitnik je preveden i prilagođen na nekoliko jezika: engleski, francuski, njemački, talijanski, japanski i španjolski. Konačni model FRAX upitnik izračunava procjenu rizika za deset godina kod žena i muškaraca, a važni su dob, BMI, visina, težina, prethodni prijelomi, pušenje, primjena glukokortikoida, reumatoidni artritis, sekundarna osteoporoza i konzumacija alkohola. FRAX upitnik kao važan korak u procjeni rizika od osteoporoze može u velikoj mjeri koristiti zdravstvenim djelatnicima kao pomoć u liječenju oboljelih sa smanjenom koštanom masom (32).

Metode i materijali

Pretražujući literaturu po bazama podataka Pubmed, Scopus, Medline, Hrčak i Znalac pretraživani su radovi koji su obrađivali kvalitetu života osoba sa osteoporozom, utjecaj riziko-faktora na kvalitetu života, te koji su od upitnika pri tome korišteni.

Rezultati istraživanja

Kosti kao i sve ostalo u ljudskom organizmu funkcioniraju kao savršen mehanizam, sve do trenutka kada unutar njih postoji ravnoteža u funkcioniranju osteoklasta i osteoblasta. Vrhunac koštane zrelosti postiže se između 25 do 30 godine života, te je od iznimnog značaja stil života osobe u toj dobi, a i kasnije sa posebnim osvrtom na provođenje tjelesne vježbe što će uz raznovrsnu prehranu biti dobar temelj za čvrste kosti (33). Za potrebe pisanja ovoga rada pretraživanjem baza podataka uočeno je da u novijim radovima najčešće korišten FRAX upitnik, te su ti radovi najčešće vezani uz faktore rizika i procjenu desetogodišnjeg rizika od prijeloma. Na osnovu provedenih istraživanja pokazalo se kako osobe kojima je vježbanje stil života, u odnosu na one kojima to nije, mogu imati i tri puta niži FRAX upitnik, kao što je u istraživanju Janković iz 2013/14. (18). Skupina od 71 ispitanice podijeljene u dvije skupine gdje je jedna predstavljala grupu „nevježbačica“, a druga vježbačica pokazalo se kako druga skupina ima niži FRAX upitnik. Tjelesno vježbanje pokazalo dobre rezultate u odnosu na povećanje koštane mase (34) i kada su osobe i u starijoj dobi redovito provodile iste, o čemu govore brojne studije poput one Gregova (35) o načinu vježbanja koje je najprikladnije provoditi, kod osoba sa smanjenom koštanom gustoćom. Ahmad H Alghadir u studiji provedenoj 2016-te kojom je obuhvaćeno stotinu ispitanica pokazuje da se u periodu od 12 tjedna provođenja vježbi aerobika srednjeg intenziteta, mogu uočiti značajna poboljšanja u koštanoj masi, Ca i Mn, te koštanog biljega alkalne fosfataze (36), no u samoj studiji nije korišten FRAX upitnik za procjenu desetogodišnjeg rizika od prijeloma. Babić (19) u svom istraživanju daje osvrt na pilates vježbe koje su provođene na ispitanicama, te su u periodu od šest mjeseci vidljivi pozitivni

pomaci, te bolja kvaliteta života oboljelih. Brojni autori poput Vlaka naglašavaju dozirane medicinske programe vježbi koji će se temeljiti isključivo na vježbama jačanja posturalnih, zdjeličnih mišića i mišića natkoljenice (37), ali pri tome ne koriste niti FRAX upitnik, niti neke druge upitnike kojima bi se mogla prikazati kvaliteta života oboljelih od osteoporoze, te načiniti usporedba rezultata na početku i na kraju istraživanja. Pretražujući baze podataka uočeno je da FRAX upitnik kao alat za procjenu rizika od prijeloma nije učestalo u upotrebi. No ipak pronađeni su radovi u kojima su učinjene procjene rizika od prijeloma popunjavajući FRAX upitnik u osoba koje su pušači, koje konzumiraju alkohol, osoba koje imaju reumatoidni artritis, te konzumiraju kortikosteroide. U istraživanjima poput Bautista-Molana (38) i suradnika ukazano je na povezanost nastanka osteoporoze u osoba sa reumatskim bolestima u samo 17,1 % ispitanika, te se u njima kao jedan od alata koristio FRAX upitnik kao način procjene desetogodišnjeg rizika od prijeloma. Također, u samom istraživanju, a provedeno je na više od tisuću ispitanika vidi se kako osobe oboljele od reumatoidnih bolesti imaju veći rizik od kardiovaskularnih bolesti nego od osteoporotičnih prijelome. FRAX upitnik kao instrument procjene desetogodišnjeg rizika od prijeloma nije korišten samo u reumatoloških bolesnika već i u istraživanjima koja su provedena na neurološkim i alergološkim pacijentima koji zbog terapije kortikosteroidima često kao sekundarnu pojavu imaju osteoporozu (39,40), te kako bi trebalo raditi procjenu rizika od prijeloma pomoću FRAX upitnika. Chan i suradnici ističu također u svojim istraživanjima kako pacijenti vrlo često nisu upoznati sa posljedicama koje nosi terapija kortikosteroidima, što dodatno povećava rizik od osteoporotičnih prijeloma, posebno kod osoba koje boluju od astme prilikom čega koriste kortikosteroide kroz pumpice. Brojne studije govore o štetnosti pušenja poput studije Kapetanović i suradnika (41) te o lošem utjecaju na funkcioniranje estrogena i testosterona, u kojoj naglašavaju štetnost nikotina koje za posljedicu ima smanjenje kalcija u kostima i veću vjerojatnost od osteoporoze, međutim pretražujući o povezanosti procjene rizika od prijeloma pomoću FRAX upitnika i ovog riziko-faktora pronađen je samo jedan rad Sanela (42) gdje je istraživanjem obuhvaćen jedan ispitanik koji je imao i kroničnu opstruktivnu bolest pluća te se ne može sa sigurnošću utvrditi što je utjecalo na nastanak hip frakture; da li prekomjerno dugogodišnje pušenje ili desetogodišnje liječenje kortikosteroidnim inhalatorima. Slična situacija je i kada se govori o negativnom utjecaju konzumacije alkohola na koštanu gustoću, pri čemu se smatra da alkohol smanjuje aktivnost osteoblasta, te sam proces utječe na BMD; Abukhadir i njegovi suradnici (43) u svom preglednom radu naglašavaju povezanost, ali i navode pomanjkanje studija o povezanosti konzumacije alkohola, osteoporoze i procjene rizika od prijeloma kroz period od deset godina.

Najveći broj radova koji su bili posvećeni kvaliteti života osoba sa osteoporozom odnosio se na primjenu upitnika kojima se nastoji utvrditi kvaliteta života nakon prijeloma kralježnice, te su u tu svrhu korišteni QUALEFFO-41 i QUALEFFO-31. Iz istraživanja Nagammai i suradnika na 215 žena u post-menopauzi, ali Tadić i njenih suradnika pokazalo se da QUALEFFO-41 kao upitnik ima veliku osjetljivost te da se na osnovu njega može precizno prikazati kvaliteta života osoba sa osteoporozom, a posebno se uočava razlika u kvaliteti života osoba sa i bez prijeloma kralježnice. U usporedbi sa skraćenom verzijom QUALEFFO-31, koja obuhvaća kroz 31 pitanje samo tri kategorije pitanja, QUALEFFO-41 je znatno više u upotrebi (44, 45).

Prilikom pretraživanja baza podataka uočeno je da je osnovni cilj provođenja obaju upitnika bio, da se utvrdi može li se isti primijeniti u različitim zemljama u svijetu na tamošnje stanovništvo, te da li će rezultati istraživanja dati „prave“ podatke o kvaliteti života osoba sa osteoporozom. Tako su Zhou i suradnici proveli istraživanje na dvije grupe žena koje su u post-menopuzi; pri čemu su jedna skupina činile žene sa osteoporozom, a drugu zdrave žene slične dobi. Rezultati su pokazali da postoji visoka korelacija u odgovorima između QUALEFFO-31 upitnika i SF-36 među Kineskinjama, te da se QUALEFFO-31 može primjenjivati za procjenu kvalitete života (46). Procjena kvalitete života žena nakon menopauze posebno ako su imale prijelom kralježnice predstavlja vrlo važnu sliku kako za pacijenta tako i za zdravstveno osoblje koje radi i prati takvog pacijenta. Uz brojne upitnike koji su dostupni za primjenu u

procjeni kvalitete života značajan je i Quality of Life Questionnaire in Osteoporosis. Marquis i suradnici su u svom istraživanju promatrali koliko jednim takvim upitnikom možemo doznati o načinu svakodnevnog funkcioniranja osobe nakon prijeloma kralješaka, ali i o emocionalnim i socijalnim problemima sa kojima se takav pojedinac susreće. U svom istraživanju kao i drugi autori koristio je i SF- 36, a konačni zaključak je kako se QUALIOST upitnikom može dobiti precizna slika o kvaliteti života osoba sa osteoporozom, te o smjernicama na kojima treba nastaviti raditi pri liječenju istih (47). 16-item Assessment of Health-Related Quality of Life in Osteoporosis (ECOS-16) je upitnika kvalitete koji zbog svog malog broja pitanja predstavlja dobru priliku za procjenu kvalitete života osoba sa osteoporozom, a da se pri tome ne gubi previše vremena. S obzirom da je on sastavljen od pitanja koja se nalaze u QUALEF-FO-41 i OQLQ; premda je kratak i brz za provedbu daje kvalitetan uvid u kvalitetu života osobe sa osteoporozom, što potvrđuju i istraživači u svojim studijama poput Lee među korejskim ženama u menopauzi (48). Hunter sa suradnicima provela je istraživanje na ženama u menopauzi kontrolirajući njihovu kvalitetu života pomoću WHQ upitnika, kojim pored tjelesnog funkcioniranja u svakodnevnom životu, važne informacije se dobivaju i mentalnom zdravlju osoba sa osteoporozom (49).

U svrhu pisanja ovoga rada pretraživane su baze podataka, te se prilikom čitanja do sada objavljenih radova o upitnicima koji se koriste ili mogu koristiti u procjeni kvalitete života osoba sa osteoporozom; može uočiti kako se korištenjem svih upitnika osim FRAX upitnika mogu dobiti podaci kojima se može poslužiti kao smjernicama u liječenju osoba sa osteoporozom. FRAX upitnik kao upitnik ima svoje velike prednosti jer se bazira na podacima koji se temelje na nalazima denzitometrije i pitanjima baziranim na riziko- faktorima koji utječu na samu pojavu bolesti. Osim toga FRAX upitnikom se može procijeniti desetogodišnji rizik od prijeloma, te se stoga preporuča kao alat za procjenu kvalitete života osobe sa osteoporozom i prevenciju prijeloma. Ostali upitnici koji su navedeni i obrađeni u samom radu imaju mogućnost koristiti se kao alati u procjeni pacijenata, te na taj način omogućiti bolju kvalitetu života osoba sa osteoporozom.

Zaključak

Svi težimo boljoj kvaliteti života u svakom trenutku. Osobe koje žive sa problemom osteoporoze i posljedicama koje ona nosi-prijelomi, imaju znatno smanjenu kvalitetu u svakodnevnom životu. S obzirom da smo svjedoci kako se broj oboljelih od osteoporoze i kod nas i u svijetu povećava, te iako znamo koji je najučinkovitiji način borbe protiv ove bolest-to je prevencija; trebamo poznavati i iskoristiti „ alate“ kojima možemo poboljšati kvalitetu života oboljelih od osteoporoze. Stoga se u radu s oboljelima uz uobičajene protokole dijagnoze, laboratorijskih nalaza, liječenja i edukacije trebaju popunjavati i upitnici o kvaliteti života za osobe sa osteoporozom. Na taj način će se dobiti kompletnija slika o svakoj oboljeloj osobi, njegovim potrebama i preporukama, te kako unaprijediti njihovo svakodnevno funkcioniranje.

Literatura

1. *Çakur B, Dagistan S, Şahin A, Harorli A, Yilmaz AB. Reliability of mandibular cortical index and mandibular bone mineral density in the detection of osteoporotic women. DMRF 2009; 38: 5.*

2. *Praščević N, Marković Lj. Utjecaj hipofunkcije štitne žlijezde na osteoporozu, Acta rheumatologica belgradensia 2009; 39(1): 16.*

3. *Pollycove R, Simon JA. Osteoporosis; screening and treatment in women; Clin Obstet Gynecol 2012; 55(3): 681-91.*

4. *Pitts CJ D, Kearns AE. Update on medications with adverse skeletal effects. In Mayo Clinic Proceedings 2011; 86(4): 338-43.*

5. *Lazić M, Spasojević G. Značaj kvantitativne ultrazvučne osteodenzitometrije u ranom otkrivanju osteoporoze. Биомедицинска истраживања 2012; 3(2).*

6. *Gregov C, Šalaj S. Učinci različitih modaliteta treninga na koštanu masu: Pregled istraživanja. Kineziologija 2012; 46: 10-29.*

7. *Bonnick S, Harris S, Kendler D, McClung M, Silverman, S. Menagment of osteoporosis in postmenopausal women: 2010 position statement of The North American Menopause Society, Menopause 2010; 17(1): 25-54.*

8. *Aksentić V, Jandrić S, Rašeta N, Todorović R, Krčum B. Faktori rizika za nastanak prijeloma kuka kod*

bolesnika s osteoporozom, Acta rheumatologica belgradensia 2006; 39(1) :118.

9. *Tkaczuk-Włach J, Sobstyl M, Jakiel G. Osteoporoza–obraz kliniczny, czynniki ryzyka i diagnostyka. Przegląd menopauzalny 2010; 2: 113-17.*

10. *Atreja A, Aggarwal A, Licata AA, Lashner BA. Low body mass index can identify majority of osteoporotic inflammatory bowel disease patients missed by current guidelines. The Scientific World Journal 2012; 6.*

11. *Valsamis HA, Arora SK, Labban B, McFarlane SI. Antiepileptic drugs and bone metabolism. Nutrition & metabolism 2006; 3(1): 36.*

12. *Karinkanta S, Piirtola M, Sievänen H, Uusi-Rasi K, Kannus P. Physical therapy approaches to reduce fall and fracture risk among older adults. Nature Reviews Endocrinology 2010; 6(7): 396-407.*

13. *Burge R, Dawson-Hughes B, Solomon DH, Wong JB, King A, Tosteson A. Incidence and economic burden of osteoporosis-related fractures in the United States, 2005–2025. Journal of bone and mineral research 2007; 22(3): 465-75.*

14. *Wright NC, Looker AC, Saag KG, Curtis JR, Delzell ES, Randall S, et al. The recent prevalence of osteoporosis and low bone mass in the United States based on bone mineral density at the femoral neck or lumbar spine. Journal of Bone and Mineral Research 2014; 29(11): 2520-26.*

15. *Anić B, Mayer M. Glukokortikoidima izazvana osteoporoza. Reumatizam 2014; 61(2): 105-12.*

16. *Ćurković B. Osteoporoza uzrokovana glukokortikoidima. Arhiv za higijenu rada i toksikologiju2007; 58(1): 19-24.*

17. *Rachner TD, Khosla S, Hofbauer LC. Osteoporosis: now and the future. The Lancet 2011; 377(9773): 1276-87.*

18. *Jankovic S, Muftić M, Smajovic M. The Association between Physical Activity and FRAX Score in Women. Ann Gerontol Geriatric Res 3(1): 1034-40.*

19. *Babić S, Jelica S, Šubarić J, Muftć M. Physical activity as an important factor in preventing osteoporosis. SEEHSJ 2013; 3(1): 63-8.*

20. *Schalffler MB, Kennedy OD. Osteocyte signaling in bone. Curr Osteoporos Rep 2012; 10: 118-25.*

21. *Košić M. Patofiziologija postmenopauzne osteoporoze. Reumatizam 2006; 53(2): 32-5.*

22. *Madureira MM, Rozana M. Ciconelli M Pereira RM. Quality of life measurements in patients with osteoporosis and fractures. CLINICS 2012; 67(11): 1315-20 .*

23. *Hunter MS. The Women's Health Questionnaire (WHQ): Frequently Asked Questions (FAQ). Health Qual Life Outcomes. 2003; 1: 41.*

24. *McClung MR, Love B, Rosen CJ. Evaluation of a new osteoporosis quality of life questionnaire (OQLQ) for women with osteoporosis and back pain (abstr). J Bone Mineral Res. 1995; 419.*

25. *Cook DJ, Guyatt GH, Adachi JD, Epstein RS, Juniper EF, Austin PA, et al. Development and validation of the Mini-Osteoporosis Quality of Life Questionnaire (OQLQ) in osteoporotic women with back pain due to vertebral fractures. Osteoporosis Quality of Life Study Group. Osteoporos Int. 1999; 10(3): 207-13.*

26. *Silverman SL, Mason J, Greenwald M. The Osteoporosis Assessment Questionnaire (OPAQ): A reliable and valid self-assessment measure of quality of life in osteoporosis (abstract 904). J Bone Miner Res. 1993; 8: 343.*

27. *Helmes E, Hodsman A, Lazowski. A questionnaire to evaluate disability in osteoporotic patients with vertebral compression fractures. J Gerontol A Biol Sci Med Sci. 1995; 50(2): 91-8.*

28. *Van Schoor MM, Knol DL, Glas Caw, Ostelo RW, Leple `ge A, Cooper C, et al. Development of the Qualeffo-31, an osteoporosis-specific qualityof-life questionnaire. Osteoporos Int. 2006; 17(4): 543-51.*

29. *Lydick E, Zimmerman SI, Yawn B, Love B, Kleerekoper M, Ross P, et al. Development and validation of a discriminative quality of life questionnaire for osteoporosis (The OPTQoL). J Bone Min Res. 1997; 12(3): 456-63.*

30. *Badia X, Dı ´ez-Pe ´rez A, Lahoz R, Liza ´n L, Nogue ´s X, Iborra J. The ECOS16 questionnaire for the evaluation of health related quality of life in postmenopausal women with osteoporosis. Health Qual Life Outcomes. 2004; 2: 41.*

31. *Marquis R, Cialdella P, De La Loge C. Development and validation of a specific quality of life module for postmenopausal women with osteoporosis: the Qualiost. Qual Life Res. 2001; 10(6): 555-66.*

32. *Hass Rubin K, Abrahamsen B, Friis-Holmberg, Hjelmborg JVB, Bech M, Pernille Hermann A, et al. Comparison of different screening tools (FRAX®, OST, ORAI, OSIRIS, SCORE and age alone) to identify women with increased risk of fracture. A population-based prospective study. Bone 2013; 56(1): 16-22.*

33. Novi pristup liječenju osteoporoze. http://www.k-centar.hr/osteoporoza.php#osteoporoza4 (Accessed) 20rd Jan 2017).

34. Gregov C, Šalaj S. Učinci različitih modaliteta treninga na koštanu masu: Pregled istraživanja. Kineziologija; 46: 10-29.

35. Hass Rubin K, Abrahamsen B, Friis-Holmberg, Hjelmborg JVB, Bech M, Pernille Hermann A, et al. Comparison of different screening tools (FRAX®, OST, ORAI, OSIRIS, SCORE and age alone) to identify women with increased risk of fracture. A population-based prospective study. Bone 2013; 56(1): 16-22.

36. Gregov C, Šalaj S. Učinci različitih modaliteta treninga na koštanu masu: Pregled istraživanja. Kineziologija; 46: 10-29.

37. Alghadir AH, Gabr SA, Al-Eisa ES Alghadir MH. Correlation between bone mineral dentisty and serum trace element sin responce to supervised aerobic training in older adults. Clinical Interventions in Aging 2016; 11: 265-73.

38. Vlak T. Nefarmakološko liječenje osteoporoze. Medicina fluminensis 2012; 48(4): 435-43.

39. Bautista-Molano W, Fernández-Avila D, Jiménez R, Cardozo R, Marín A, Soler MD, Gómez O, Ruiz O. Epidemiological profile of colombian patients with rheumatoid arthritis in a specialized care clinic. Reumatol Clin. 2015.

40. Chan V, Cave AJ, Banh HL. Self-reported osteoporosis prevention in inhaled corticosteroid users in community pharmacy setting. SAGE Open Med. 2015; 3: 2050312115586912.

41. Coşkun Benliday I, Başaran S, Evlice A, Erdem M, Demirkıran M. Multipl Sklerozlu Hastalarda Osteoporoz Tedavisinde Bifosfonatların Etkinliği. Türk Osteoporoz Dergisi 2015; 21: 53-7.

42. Kapetanović A, Avdić D, Marković K, Basarevic M, Lokmić E. Uticaj rizikofaktora za osteoporozu na gubitak koštane mase kod žena u menopauzi. Journal of Health Sciences 2011; 1(1): 28-30.

43. Sanel S, Sezgin G, Sarıman N, Ugutmen E, Solakoglu C. Bilateral non-traumatic hip fractures in a heavy smoker COPD patient on inhaled steroids. Arch Osteoporos 2016; 11(1): 8.

44. Abukhadir SS, Mohamed N, Mohamed N. Pathogenesis of alcohol-induced osteoporosis and its treatment: a review. Curr Drug Targets. 2013; 14(13): 1601-10.

45. Nagammai T1, Mohazmi M, Liew SM, Chinna K, Lai PS. Validation of the Malay version of the Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO-41) in Malaysia. Qual Life Res. 2015 Aug; 24(8): 2031-7.

46. Tadic I, Vujasinovic Stupar N, Tasic Lj, Stevanovic D, Dimic A, Stamenkovic B, et al. Validation of the osteoporosis quality of life questionnaire QUALEFFO-41 for the Serbian population. Health and Quality of Life Outcomes, 2012; 10: 74.

47. Zhou C, Li Q, Huang S, Fan L, Wang B, Dai J, Tang X6. Validation of the simplified Chinese version of the quality of life questionnaire of the European foundation for osteoporosis (QUALEFFO-31). Eur Spine J. 2016 Jan; 25(1): 318-24.

48. Loge C, Sullivan K, Pinkney R, Marquis P, Roux C, Meunier PJ. Cross-cultural validation and analysis of responsiveness of the QUALIOST®: QUAlity of Life questionnaire In OSTeoporosis. Health Qual Life Outcomes. 2005; 3: 69.

49. Lee JS, Son SM, Goh TS, Kim TH, Noh EY. Validation of the ECOS-16 Questionnaire in Koreans with Osteoporosis. Asian Spine J. 2016 Oct; 10(5): 877-85.

50. Hunter M. The Women's Health Questionnaire (WHQ): Frequently Asked Questions (FAQ). Health and Quality of Life Outcomes 2003; 1(1):41.

Corresponding Author
Mirsad Muftic,
Fakultet zdravstvenih studija,
Univerzitet Sarajevo,
Sarajevo,
Bosna i Hercegovina,
E-mail: mhs@bih.net.ba

Role of teacher(s) of contemporary school in developing student's competences

Adisa Milic, Mensura Kudumovic

University of Sarajevo, Faculty of Education, Sarajevo, Bosnia and Herzegovina.

Abstract

The modern concept of education, in which the focus is on the students, asks for a specific analysis of the role of teachers and students in the teaching process and changes in the educational system. The needs of society in the future will require the growing involvement of teachers in the process of teaching, as well as in the leisure student's time, extracurricular activities, better and quality cooperation with parents and the community.

The challenges faced by the modern schools assume new, quality relationships, attitudes and thinking of all the subjects of the educational process. The modern school wants to overcome these challenges and enable students to acquire knowledge, help in developing skills, physical development, socialization, resourcefulness and other useful skills so the student is prepared for life and is capable of finding his/her place in society.

The acquisition and development of competences of young people and their successful individual and social functioning largely depends on their education, but also teachers are an essential factor of the entire educational system.

The role of the teacher in the school is of great importance to the educational system. By his/her approach, method and skill to communicate, work and dedication, every teacher can contribute to the improvement in working with students and at the same time affect the environment. The teacher, who along with the parents prepare children for future life, should be the person with the highest qualities of the personality but also the ability, a coordinator, a consultant, an evaluator, a confidant and a friend of the participants of the teaching process.

The need for the founding and the establishment of a quality school whose work is based on the same high quality meeting of the needs of all participants in the teaching process that work together, continuously and without coercion, is such an urgent need of today. Today's schools need major changes within the entire educational system in general, and each school individually, and should be taken as a process that primarily starts from teachers.

Key words: student, teacher, quality school, parent, competences, lifelong learning, social education, cooperation, empathy

Introduction

The role of the school in time and environment in which it exists, means training students to understand and accept the changes imposed by society and its rapid development. As an organized social institution, schools should be in accordance with the needs of the time in which we live, the needs of the future, but within influence of various changes set by the society and imposed by environment, it is placed in front of big challenges.

By resisting various pressures imposed, school enables developing a key role, which is to prepare young people for an active life in the modern and democratic society. Advantages and prerequisites for success are acquired even in a school classroom, and a lifelong learning becomes a principle of education policy. The obligation of the school to humanistic, psychological and didactic theories is to enable students to acquire two types of competences: the intellectual, which will enable the development and reward of natural potentials, and social, which will train students for taking their own place in society and the division of labor.

Competence for lifelong education is considered to be one of the key competencies in contemporary education. Acquiring the necessary competence should be monitored by autonomy and self-determination as a basic human right, but with an obligation for school and teachers to train students not only for acquiring knowledge, mastering the teaching contents, but also to develop an autonomous personality, which along with other

factors, makes a unified whole. Modern conceptions of teaching indicate the need for the teaching process that will be boast with rich interaction of opinions, ideas, attitudes, focusing on student who is at the center of the educational process. The student, during the educational process develops his/her personality, form values, intellectual skills, develop self-criticism and criticism and learns to communicate correctly. Cooperation with the teacher can be seen through the fulfillment of needs and expectations, freedom to interact with others, through democracy, confidence, empathy, tolerance and a number of other positive, desirable and necessary personality traits. Modern school is transforming every day from an institution for the passing of knowledge into the educational organization in which that knowledge is acquired, where the student in cooperation and partnership with the teacher develops his/her skills, knowledge of the world and participate in its changing.

The traditional role of the teacher in which the student is asked for motivation for learning and training for life, is preferred even today. However, the traditional lecture role of teachers in which he serves overall knowledge and facts, requires substantial change and the need for teachers to encourage students in the teaching process to think, to gain problem-solving skills, which leads to the need for higher attention to the planning and preparation for the time and the teaching unit.

As creator of educational content, the teacher should be a partner in communication with students, but also the expert who manages the teaching and guiding it. Being a successful teacher is perhaps the most difficult profession today. Successful teaching should mean that all students are doing well, at full capacity in order to achieve quality work. We can say that today very few students are doing well because teaching contents and their concepts do not improve student's quality of life. To change the perception of teaching content and make them quality for both the students and the teachers, parents and other participants of the teaching process means having a quality school or aim to it. There is no doubt that the most successful people are those in which there is no fear of change, and those people are significantly less than those who are proactive.

Characteristics of glasser quality school

Quality school - school without coercion, according to Glasser, is a school or a place where all its entities: teachers, profesors and parents can meet their basic needs because it is a condition for quality work and success in education. Effects of school should refer to all forms of institutional and non-institutional organization of educational work.

The goal of a quality school is working without coercion or the failure, and it is based on mutual respect and appreciation of teachers and students as the main participants of the teaching process. Quality school, therefore is a school of choice. Theory of choice interprets in a new way, how we choose the life that we live, how our work is our choice and that choice is our responsibility. The democratic work mode puts the teacher in front of new tasks and at the same time significantly extends the function of students who actively participate in the upbringing - educational process, contributing to teaching and his/her own development, but also the teamwork to which modern school aims to.

The purpose of quality school is to indicate to students on ways of improving the quality of life, the need of building up themselves and their work, and this can be achieved through a school that provides them with adequate knowledge based on the linking of facts and practical applied knowledge, instead of the current learning by heart. To achieve the quality, students must love what they do, and this is achieved by meeting the first four conditions for quality work:

- to be recognized and appreciated (by students) as a person who has created a pleasant
- working environment
- that the students believe what you ask from them is useful
- that they are willing to do their best
- that they have learnt to evaluate their own work and based on that to improve it (Glasser, 1999: 79).

To achieve all the four conditions it takes a lot of patience, with no complaints and threats. First of all, students should get familiar with the meaning of the word quality, talk about quality, get closer to its meaning through theoretical and practical

examples so that the students would understand the meaning and purpose of quality. The quality of their work and learning, students need to connect with the school and the teaching process, and start doing quality things.

Working environment within such conception of education is based on free will. The work of quality school is based on the principle of choice, not bossiness, which becomes a major cause of current problems in education. Bossing as a form of governance should be replaced with leadership, both by teachers and school management, and directors themselves, to support teachers and help them in the implementation of class quality management. Students, in agreement with the teachers, decide on their own what is useful for them to learn, they invest their own efforts in order to achieve desired results and success, and the level of acquired knowledge is based on self-assessment of the individual. Quality School has six conditions for quality work (Glasser, 1999: 36) as follows:

1. Class environment should be enjoyable and stimulating: such environment is easily established if, among students and employees of the school, there is a friendly relation based on trust, belief and understanding that the whole teaching process and everything that is done is based on the well-being of the other, and again with the open and frank discussion, with no sight of coercion. To encourage students to be active participants in the teaching process, to invest hard work and efforts in order to achieve success and teach them to make their own assessment of their work and as well as the possibility of progress and improvement in their work, represents an important segment of the educational process and one of the essential tasks of teachers.

2. To work on something useful should be required from students: quality work is always useful work, and it is up to the teacher to explain to students what benefits they will have from what is required of them and what is the purpose of learning. Learning useless things happens in cases of urge and conditions in order to accomplish something that we want. Students consider their theoretical subjects to be of little use in life and that they are necessary for college or for obtaining a diploma that will help them in process of employment. In this regard, by emphasizing the importance and usefulness of quality, students will concider quality school as a condition that will help them in their near and distant future and a prerequisite for employment. According to Glasser students should be encouraged to write about anything that interests them, because quality academic writing is exactly one of the two skills that most closely can be linked to success in life.

3. *Students are asked to do the best they can*: every quality work requires a certain kind of effort and investment of time, and it is up to teachers to be patient with students through the achievement of quality work and the results in process of students adaptation to learning and quality self-achievement. Quality does not happen, but must carefully be cultivated, says Glasser and cites a few tips to teachers to make that process more quality (Glasser, 1999: 83):

- Talk enough about quality to help students understand what it is.
- Start with the task (best is a written task) that they hold useful and effort valuable
- Ask them to keep working on that task and fulfill it well.
- Do not mark these works: good score interrupts the process because students may think that they have done enough, and a poor rating interrupts the process because it is discouraging.
- Ask them to improve their work. To provide them with help, ask them to explain to other students or to you why it was a lot better after corrections.
- At first, settle with corrections: do not insist on quality. When they realize the value of improvements, quality will come by itself.

4. *Students are asked to evaluate and improve their work:* the task of teachers in quality school is to teach students how to evaluate their own work in order to be ready and motivated to improve their work and up-date it, and this will best be achieved if we do not complain on students and if we do not present them our dissatisfaction, but only the positive things and characteristics of their work. Self-assessment and evaluation of their own work as well as making a habit of self-improvements during a certain period of time will lead to desired results, the quality and the development

of competences and intellectual self-confidence. As the quality can be achieved mainly by cooperation, the students should constantly be encouraged to help each other and ask for help, in order to achieve required, but also needed quality. Such working conditions can be achieved if students are approached by someone who will lead them and guide not boss them, because in that way we show the power that creates the opposite effect and affects the quality of teaching diminishing its value.

5. Quality work is always good: students feel good if they manage to do something well, and a great pleasure for them is when they do something useful by their work and when other people notice and praise that. Therefore, evaluation of student's progress and effort, not just what they have learnt, is one of the characteristics of quality teaching. Then, they feel comfortable in school, and the eeling of comfort and satisfaction is present both in teachers and parents. Students should be pointed out the fact that their work, but also the consequences of inaction are very much noticed, and that with hard work success can be achieved. William Glasser sees quality schools success precisely in its quality education that is not based on coercion and authoritarian style of work and says that "a successful teacher is the one who manages to convince not half or three quarters but all of his or her students to enggage in school quality work" (Glasser , 1994: 25). The desire to learn should come from within, not by any coercion and punishment. The motive for the school must be awaken in children and it is the highest obligation and objective of profesors and teachers. If the teacher does not awaken the student's interest to explore by him/herself and come to the conclusion on his/her own, then the teacher has only done half of the job.

6. Quality work is never destructive: Since the students are suspicious of the values for which the school stands for, the task of the teacher is to convince students to believe them to be on their side, and that all they ask them to do is for their own good. A teacher, with his work, a style of work, must find innovations so his work meets all the aspirations and needs of today's students and modern society. One of the important characteristics of a democratic style of work is creativity through which the teacher encourages students to creativity and innovation. A student creates by working, comes to new discoveries, innovation, original solutions and tasks in specific problem situation. Creative students are constantly in search of something new and more modern. They constantly find new, easier and more useful forms of work, which ultimately contributes to the improvement of educational work and better outcomes for students. The creative school respects the student's mood, feelings, judgments, and encourage confidence, courage, initiative, tolerance and training cooperation, which aims to enable every student to enrich their creative potential, and discover the treasure that lies within each of us.

Life skills have always been the foundation of the curriculum because they are the foundation of all education and should not be limited to primary school, but the foundation of these same skills should be in it. Quality schools teach basic skills, and are referred to as fundamental because most students know enough about them and want to master them. Almost all students understand that it is worthwhile to acquire basic skills such as speaking, reading, writing, arithmetic, problem solving, and that those abilities are requirement to achieve the desired success in life. The subject of quality schools are facts that are understandable and acceptable for students and teachers, the facts that are indirectly related as a viability which will be useful to them in life, the facts necessary for college and finding their place in society, but also those that students want to learn and the obligation of teachers is to instruct them. The focus of quality schools is therefore in quality work and quality in satisfying the needs of all participants in the teaching process that operate continuously, without coercion and work together.

Quality school should not accept the work of low quality or low rating, but if it come to that, teacher needs to work on motivating students, encourage him/her to improve the success and better work realizing that situation as something that represents the current difficulty. The lowest score on Glasser should be verygood (B), which means that poor grades do not exist.

Teaching non-academic skills such as art, music and drama, with professional skills should be part of a quality school because they are part of our lives. Although students in traditional schools teach these skills and they can be very well trained

if there is special interest in them, though there is no special focus on the field. Quality schools in the first place put the quality, the need of the modern world, not the field of acquiring knowledge, and therefore more students are involved in art, which is an important segment of the academic subjects or developing academic skills.

The width of the teaching content should be something that is tryed to be avoided because, it is not a prerequisite for achieving the required quality. Work on practical matters through individual subjects in school according to Glasser, would encourage students to unity, and better coping with everyday life. Encouraging students to extracurricular activities, interest in student achievement and interest in his free time and the way it is spent, can be one of the factors for better performance of regular classes and attracting the attention of students in regular classes. As a professional, the teacher should write a brief overview of all the content that students will study during the year and thus prepare them for work. Pointing out the benefit and quality which the student will have from the planned contents, will occupy their attention, arouse interest and create a sense of intimacy between teachers and students.

Homework, according to William Glasser, which the student will do in interacting with parents, with the prior adjustment of the homework so the students work on it with pleasure, leads to the creation of a wider image and better knowledge.

Unlike current practice, as well as the current situation in the educational system, Glasser believes that teaching would be better and more efficiently performed if there was an increase in departments/classes or reducing the number of student in one class. Students would thus become more familiar with each-other, there would be created more comfortable working atmosphere, motivation, creativity, easier task solving, but also more effectively solving of possible problems.

Teacher quality school

Teacher in quality schools should be a professional and should use all the educational tools at his disposal to make teaching in very good quality. By getting to know the students, teacher in quality school is constantly searching for a better way of working and asks the students an opinion about it. While pointing out the importance of hard work, classroom atmosphere is never gloomy. The teacher-leader tries to create a milieu in which students enjoy (Ilic, 1998: 256).

Love towards children is an essential condition for successful work with them and achieving the desired results. If we want to carry out our mission with integrity, honesty and responsibility, love for children primarily and alone should be responsible and constructive. To be happy and satisfied we must have a minimum of love, concern, fun and freedom built into every day of our life (Glasser, 2000: 149). Satisfying these needs without coming into conflict with the needs of others, are the features of the responsible person and the quality school tends to that, to make students, with the help of their teachers, responsible people, grow up to be responsible persons. Lack of love results in finding only student's flaws and imperfections, we see the limitations but not possibilities, and all this leads to criticism and rebuke.

Teaching, according to Glasser, is an especially heavy activity if ignored the needs of students and teachers, and teaching methods in this case are doomed to fail. For a high quality and productive work and motivation of students, it is very important to establish a positive classroom education, which is usually described as purposeful, working, relaxing, friendly, stimulating and tidy. Such atmosphere facilitates learning by managing and maintaining a positive attitude and motivation of students to instructional time/class (Glasser, 1994: 45). In everyday teaching, teacher expresses his/her opinions, attitudes, and ensures to see all, hear, recognize, notice, encourage, empathize, draw attention to student's behavior, actions and advised them to be responsible and determined in terms of achieving their goal. Then, teacher's work is considered successful, the communication with students is at a high level, and all that creates high-quality interaction between teachers and students which contributes to quality of teaching process. In addition to the aforementioned, improvement and enhancement of teaching assumes the obligation of teachers to question the everyday actions, methods of work, communication and social skills, to develop the habit of self-reflection (self-assessment) as well as the evaluation of student

achievements and feedback to students on their success. Although at first glance it seems impossible, because of the amount of effort and time that should be spent struggling to adjust ourselves and students to "different classes", in time, this will be such a completely normal mode, with the aim of developing the students' desire for independent research and teaching. By linking unfamiliar things with familiar, along with the teaching materials, student gets the idea that he/she studies useful things, and more importantly, students will want to check the information independently, complementing and offering their vision of the problem.

Development of social culture of students is another task in series of tasks and competences of teachers, which is reflected in the creation of such an atmosphere in the class in which student's capabilities and self-initiative of every individual will come out. Students should be more focused on how not to be afraid and express their opinions, learn how to assess and evaluate their own work and the work of classmates. Therefore, the assumption of successful activity of teachers is reflected in the possession of competencies that define him/her and determine his/her characteristics: "Competence (lat. Competere) indicates the competence, scope, and authority of an institution or person, competence: an area in which a person has the knowledge, experience" (Klaic, 2004: 715).

Trust and respect are yet another task of teachers. By relationship based on trust, we can influence the behavior of students and build better relationships. Respect, as another important part of quality relationships, first of all should be present in adults, in this case the teachers, if we want individuals or students who will, in the same way, treat one-another. With good organization, communication, presence of humanity and sympathy for students, their progress, we will urge them to get better results, marks, success and reduce the fear of failure. The rating/mark has never been single and irreversible, and certainly is not the only evidence of the success of students. "To create trust is to create the feeling that I take care: I'm here to help, not to hurt you. Take care of your interests. When you successed, you meet your needs, then I am experiencing the same thing. "Dr. William Glasser.

Of course, an essential requirement for good performance in the teaching process is certainly the quality of the teacher, his expertise and professionalism. The key role of the teacher is to implement the necessary knowledge and social skills in the personality of the individual so that he/she can take advantage of all his/hers potentials necessary for life in modern society. A good teacher, through meaningful, creative and differentiated teaching, loves, leads and encourages students to go to their goal and form such a personality that contributes to individual, family and society as a whole. By developing their skills, students will be motivated to achieve even better results, and the teacher will be able to recognize a possible problem by observing and reviewing the overall situation in the classroom or the environment, to examine it from the perspective of students and help solve it. Therefore we can say that some of the most important qualities of a successful teacher is critical and creative thinking, pro-social opinion, society-oriented opinion and opinion focused on the future.

How to achieve that the student does not study because of the mark, but only because knowledge is an eternal mystery. Long established evaluation process itself, is so inwoven into school system that is very difficult to achieve a change in the perception of students. By their efforts teachers should strive to explain quality content of material and make an evaluation concept in a way to get students understand that they are required a high-quality knowledge, not the dryness of facts. Personality and professionalism of teachers therefore, constitute an important factor of quality schools which opts for progress, development and success in learning.

When we talk about improving the quality of teacher education, it should be taken in notice that it is not only their education that is important but, from the perspective of the concept of lifelong learning, their professional development is also very important, and continuous personal and professional development that will be featured by the quality and continuity. Both forms of education aim at lifelong training and renewal of knowledge and skills of teachers, but again in the function of creating a stimulating working environment and lifelong learning in students. Emphasis is placed on competence development that will lead to the greatest possible connectivity of the theoretical and practical part of education and the output achievements on the basis of internal resourc-

es. There is no and can not be, a quality education without well-trained teachers. Innovation of teaching which should provide new values and the realization of a man represents teachers whose initial education and later on education will be within the function of new needs (Vlahovic, 2000:117). Continuing education allows teachers to meet the professional and personal needs, which further encourages the development of their autonomy, affects the concrete quality of work and motivates teachers, and his/hers colleagues to continue to thrive. Education and professional development of teachers is a key issue for the efficiency of the educational system, because of the quality of teaching staff depends on the level of student achievement. The teaching profession in addition to the aforementioned implies a high degree of professional ethics. Being familiar with the purpose of raising means to understand and approach the goals and tasks of the subject, to realize it in the most appropriate manner and indicate the purpose of them in their daily lives through their implementation. The formation of students characters, instilling ethics and core values necessary for further life, safe and healthy environment, implies a maximum commitment to each student individually.

Every student in school should feel good, and in order to be so, he/she needs to know to communicate. Communication starts with the head teacher, students from class and continues with other staff members, teachers, students, and all participants in the educational process. In class communication is important because it reflects the climate in the whole school. Communication skills, in addition to education, is one of the roles of teachers in the earliest years of schooling. Class teacher is obligated to get his/her students familiar with the ways of communicating, allow them to learn about themselves, develop a positive attitude when it comes to themselves, teach them to talk, to listen, to observe, to know each other better and respect each-other, so in higher grades students are prepared for cooperation and teamwork and thereby build quality communion. Contemporary theories of communication are referred to as the key to successful social relationships and desirable behavior. Proper and free communication is the guarantor of quality interactions, and it is a halfway of a successful teaching process. Communication is successful if the student and teacher equaly understand the message, and a modern and successful teacher is one who realizes high-quality and free communication with students. The way we communicate with students is a model by which they communicate with others. In its most general form of the whole educational process in school can be defined as an interactive relationship that establishes communication. The effects of educational work can be significantly influenced by the structure and quality of established relations in the class (Kostović, 2006: 7). For teacher in order to have a successful communication with students, he must act empathic, should know how to empathize with the feelings of his/her students. Only then he/she can hope for positive peer interaction and interaction between teachers and students, and to do so, he/she should be aware of themselves and their attitudes, which can help him/her to accept students as he/she is, with all the faults and virtues.

Today, in modern conditions, when education in order to be productive and quality must be accompanied by rapid changes in everyday life, the role of school is significantly altered, and expectations are higher than ever. The changes that the development of information technology brings with it, the ability to use various sources of knowledge that are no longer limited to the book, and teachers, as well as a new system of communication, entail a new atmosphere in which the school is not the only center of learning and development of young people. However, this does not mean that the responsibility of school is less than before, on the contrary. This situation affects the value system significantly changes and deepens the mandatory teaching staff that is constantly improving, to keep abreast of changes and to constantly work on the further education, so that students are pointed to the demands of modern society in the future. The school is now expected to give the children a proper education that will help them in future in providing economic security, enroll in the universities and prepare them for a successful business and earnings, which means that any general school should be professional, and each vocational school to be a general. It is expected to join the concrete, actionable knowledge with general education, high level of professionalism of teachers, not only in the sphere of a specific subject,

but in all areas that are dominant in the market, modern equipment in schools, especially when it comes to IT equipment. The introduction of ICT in the teaching process, the teacher enhances their awareness, acting in accordance with scientific achievements, but also encourage students to independent research, study, discussion, interpretation of obtained information and their use in specific working conditions, and also receiving and feedback on the gained knowledge. Therefore, Information Technology and the Internet radically change and transform the school. (Kudumović, 2006: 6) As society develops, the responsibility of schools is increasing, and the job of educators is more demanding and comprehensive. The most important task of the school is to monitor changes in all spheres and to make changes in education in relation to the changes, because the school needs to prepare students for real life. Modern school should develop between science, technology and culture and function to interact with these three areas that are essential for the real education and from which it draws the knowledge and inspiration. Today we know that what surely changes and improves educational activities, but also the awareness about it, the pedagogical theory, is a persistent pursuit of its activists to do better, their willingness to get in to invest the effort, their knowledge that it can work better and successful and that it, if done like that, depends only and only on them (Stoll and Fink, 2000).

Traditional schools "do not care" weather the students enjoy in the school work and whether the work meets their needs, so the biggest drawback of the traditional schools is seen in motivating students to do useless work. Traditional school is static, and as such can not meet the demands of modern education, as opposed to the teacher who is not a static and whose competence are determined for lifelong learning and research. In a quality school, the task of the teacher is to explain to students the benefit of what they are asked and how to achieve it in practice. Encouraging to learn useful skills is not always the most rewarding job. Conditions for quality work at school often represent more than learning definition, although certain facts are necessary to be adopted. However, the application of facts or the application of learning and placing it in the context of the time leads in quality knowledge of students. Helping students to do something useful is a key factor for the development of students' willingness, effort and achievement of quality results in the end. By countless times it has already been stated that traditional teaching not only suppresses and stifles independence and self-initiative in students, but also hampers innovation of the teachers. The efficiency of traditional teaching is reflected in the amount of information that students have adopted, not the extent to which students are trained to independently acquire knowledge and weather they are able to separate the important from the less important. Unlike traditional school and its understanding of the teaching process, where the emphasis is usually placed on the classes, modern school gives priority to student. The biggest drawback of our traditional education system that is constantly trying to "motivate" students to do useless work. It is like head-executives do not understand that people cannot be motivated to do something that does not meet their needs (Glasser, 1999: 56).

Needs and requirments of modern times student

While earlier, literate person was considered to be the one that could write, read and count, today in the modern, digital age literate is a person who is an information and media literate, respectively, person that reasons critically and has ability of problem-thinking, team work, and ability of the best use of new technology. To be educated and successful, students are required precisely the skills of the digital age and that is why it is important that the school and the education system go through the transfer of knowledge and value system, and transmits the aforementioned skills. Some of these skills are:

Literacy of digital age: it is not so important any more how and how many information students will adopt, but what will they do with it. This means that to succeed it is necessary to know how to analyze, manage, integrate, evaluate and create information in a variety of media, which means that they possess information and media literacy. Although the school do not overly insist on productivity, it is directly linked with good results, success and advancement in all respects.

To make students achieve the level of quality that modern times require, it is necessary to know how to take advantage of the features and benefits from the digital tools and technology at their disposal, as well as to properly prioritize, plan and acquire new skills.

Creativity: to create, which is the highest level of learning, in addition to overcoming all other levels of knowledge a dose of creativity is required. Creativity is finding new connections, relationships and possibilities of fitting the known elements in order to create something new. If we want to enable children to be successful, we need to nurture and encourage their creativity and good ideas that lead to creativity. We must allow students different ways of thinking and seeing the world, finding new approaches to problems and tasks, instead of trying to "molde" and instill them into the same patterns of behavior.

Problem thinking and problem solving: is considered the most complex of all intellectual functions. It starts from the assumption that knowledge is not adopted just for the sake of mere learning and getting good grades, but it is necessary to know that we acquire from different areas linked into a whole that can be applied to solve specific tasks, situations, problems, and to be in the function of finding solutions.

The system of values and responsibility: education has never been and should not be a standalone process, but always go hand in hand with education. One of the most important function of schools is that it forms quality young people who will help building a proper system of values and allow them to develop themselves into a person with integrity. Ethics and securities systems in particular are gaining importance in the modern age of technology, networking, and complexity. It is important that students instill the right values to properly use of all the tools and technologies that are available to them, but also to realize all the responsibility of using them.

Collaboration: is the prevailing principle that only by working together, sharing ideas, by knowledge and skills, by joining the abilities there comes best results. It is therefore very important in children since early age, and particularly through high school that is preparing for an intense involvement in the adult world, they develop skills of cooperation, establishing communication, healthy exchange of opinions and ideas, proper conflict resolution and compromise. Communication is the bases of any cooperation, but the main prerequisite is for it to be two-way, and that any information has feedback. Achieving the desired communication depends exclusively on the acquisition of knowledge and skills of expression, writing, proper communication, proper creating messages and sending the right message.

Problems of teaching profession

For the teaching profession, we can say that it comes immediately after the parents and it is very difficult to define all the obligations this responsibility carries. As an educator, someone who teaches, is difficult to define their obligations and still more difficult to be fulfill them equally. It often happens that one of the duties due to set obligations is ignored, so in this way we give priority to the duties that have to be in the background, as is the case of the administration. Today it is difficult to organize training to maximally meet the mental abilities of students, relied on their previous knowledge, pace and mode based educational content on occupations and motivation, as well as monitor and acknowledge the specific type of reaction that students exhibit in the process of teaching and upbringing (Dunđerović, Radovanovic, Levi, 2009: 296).

Teachers calling, within the majority of their work is exposed to the public, and the teacher is someone who is constantly present in the sphere of public and cultural life, and takes maximum responsibility for what he/she says, does, how he/she behaves, and whether his/her example affects students either positively or negatively. Teachers are required to be intellectual, moral and psychologically stable person, with the clear beliefs and attitudes, which shall at all times be aware of his/her moral responsibility, needs of flawless behavior in school and on the street, and a friendly attitude towards colleagues. Due to the absence or lack of respect and trust, as an important segment of building quality relationships between teachers and students, lack of motivation to participate in the teaching process and the desire for quality work and learning, there may be an "abuse" the

position of the teachers, which leads to restrictions in the universal development of students and constriction in certain forms of teaching and non-teaching work.

Boosting the mutual care, respect and helping the teacher creates a friendly relationship with students, shows them the importance of mutual cooperation as one of the factors to achieve success, listens to them and is interested in what they are saying, learns their thinking about the work, delivery of instruction, solves possible problems between them and thus they first of all, by example indicates patterns of behavior, activities and communication with others, points to the essence of quality work and his/her need.

A special difficulty in teaching profession are the conflicts among students who may have different reasons. The consequence of such behavior in class or school disturb the established order and harmony, and human relations become intolerant and produce negative effects and consequences for all participants in the teaching process, so it is important to find out why it happens. Causes of student disobedience may be different: suspicion in authority, boredom, long-term mental strain, inability to carry out the activity, conviviality, low school self-awareness, emotional problems, social relations, negative attitude towards certain segments of the teaching process or negative attitude towards everything in general. Disobedience will increase if we successfully and just do not solve problems of this disobedience. After we determine the causes of conflicts, it is easier to go in solving problems and finding solutions. The key to establishing good discipline in the classroom is that students accept that the teacher has the right to manage their behavior and progress in learning, but not because it can serve as a source of power, but to organize better student's learning. Establishing authority of the teachers depends on the status of teachers to whom it has always been expressed respect and appreciation by the entire society. Relaxation, security and confidence contribute to leaving an impression of the person in control. If students notice that the teacher has a great knowledge of a subject or an object that can professionally organize learning activities, then students will appreciate more the art of teaching and will be able to manage their behavior. In addition to the aforementioned, good organization certainly implies the establishment of clear rules of conduct and expectations regarding student behavior, respecting those rules and imposing their own view on the situation when conflicts occur. Such classroom rules can tell the teachers or students.

Contemporary forms of cooperation between parents and school

School and family are the two basic and most important factors that have an impact on the overall development of students. In order for a school to be successful, it requires a constant interaction between students, parents and teachers, and a student in the middle of this interaction, with all his/her individual potentials. To achieve good educational harmony in the work, is the first and most important step in the creation of quality, whose most important factors are students, teachers and parents, a modern school enables creating just such harmony. By helping the children to be successful in school today, we improve their success in the workplace tomorrow. Children want and need their parents to be involved in this process. The family that operates as a small organized social units, which is a mediator between the cultural and social environment, on the one hand and the child on the other hand, has great opportunities for individual approach to the child, approaching his/her individual characteristics, as well as the involving the child in the family collective.

The basis of family relationships are made of understanding and friendship, and parental role, which is reflected through the love for a child and care for him/her, is very complex and includes several segments. Children largely form a worldview based on their parents, a way of life and relations in society, so we can certainly say that one of the roles of parents has educational character. The presence of good family atmosphere guarantees a valid behavior of children as opposed to unsettled family relations, where children usually exhibit some form of behavioral disorders. Family education and family life in general in the development of every child is the most important level of education of future social and cultural personalities. Parents should be taken into account as the first teachers who know the individual characteristics of children, and that is why they are important

partners for teachers in the processes of educational progression of their children. For this partnership to be successful, it is necessary to educate parents and teachers to achieve good mutual communication. Modern school works in partnership between school-parent, which offers consulting services and consulting regarding joint conflict resolution and motivation of students to work and learn, inform the parents about the programs and goals of the individual field of educational work, the child's progress, or non-progress, the educational measures in family and school are coordinated, there is achievement that child starts to love school work, willingly go to school, meet the school requirements easily and willingly, behaves well in school and on the street and selects content that will affect the enrichment of his personality. The monitoring of students' work and development, including parents in the programs and goals of different fields of educational work, allows the removal of potential difficulties which hinder development and prevent the occurrence of delinquent behavior. Numerous educational tasks can not be performed without the close cooperation of family and school, and this is why the partnership between family and school in the function of improving the overall educational - educational work is important. Therefore, helping children to enjoy learning and being successful in school should be an important objective of the parents, family and schools. From the above it can be concluded that without genuine, content-rich and focused plan of cooperation of family and school, full success in the education of young people cannot be accomplished.

Conclusions

Since the contents, objectives and tasks of the school as an educational institution are specified by needs of the society and current living standards, changes in society have significantly influenced the changes in the school, school system, and especially on the position of teachers in the teaching process, his/her relationship towards the students, work and an embodiment of the teaching process at all. Modern age puts big and complex tasks for education and quality school is increasingly coming to the fore. A quality school work is based on the development of students 'and teachers' competencies, centered on lifelong learning and training of students, but also teachers which defines him/her as a competent professional in a modern school. The need to enable students to develop key competences by the end of initial education, which is a basis for further learning, is a major challenge for our education system.

Today teachers are expected to have a solid general and vocational education, quality professional preparation, teaching, communication and social skills, creativity, innovation and entrepreneurial activity. The teacher should possess the quality of personality as should be an example to his/her students and society in general, to incorporate in student's system certain values preparing them for social life. The expectations are reflected in identifying and meeting the individual needs of students, their capabilities and interests, assessing students' success and teachers own impact on student development and education. Enabling students to develop their skills and actively participate in the work excluding current forms of passivity, to act creatively and creatively, developing a constant need to acquire knowledge, education, enabling him/her to work independently, as well as learning from their own mistakes and the mistakes of others, the teacher directs students for the future that will create them according to their interests.

Teachers should pay more attention to the quality of their work, with a more emphases on interaction and communication access to education and change communication style of authoritarian to collaborative. With the student as the subject rather than the object of work, the teacher creates an environment that contributes to building positive attitudes of students, creating a sense of belonging, mutual assistance and identifying with others, as well as sharing the same goals and values.

Teachers must find a balance between the individual and the local, between tradition and modernity, between competence and cooperation and ensuring equal opportunities for all, because the vision of school represents what we strive for and what we are willing to do, and for this we need people that are happy. The teacher's job does not need to end the moment he/she left the class, but when he/she feels that he/she has contributed to society in terms of education and educational activity as individual, which will in future require

increasing involvement of teachers to the teaching process, as well as students free time, extracurricular activities, better cooperation with parents and the community. Effective communication between schools and parents should be timely, ongoing, two-way, based on mutual tolerance and respect in order to build mutual trust, partnerships and monitor students progress or lack of progress. The quality of obtained communication to meet the needs for security and care, excludes any form of insecurity and creates an atmosphere conducive to learning and the development of social relations.

Today, when a lot is said about the negligent of the educational function of school, it is necessary to find a modern, student acceptable ways of realization of the educational objectives and tasks of teaching, for what in this regard, and within the development of communication skills is considered to be one of the most important objectives. Including empathy, tolerance and social sensitivity, unity and cooperation, respect, understanding and respect for diversity, with social competence of teachers, the high-quality work in the contemporary school environment is enabled.

The changes that have already taken place and those that are yet to come, are significant and represent major challenge for teachers as creators of the school curriculum, school culture and social relations in the school of whose work among other things depends on the quality of the school.

In addition to the information technologies that play a crucial role in the educational process, communication through word, suggestion, praise and trust form the basis of quality schools and effective learning outcomes. Although we are faced with many obstacles in our line of work, the principles of "Quality School" of William Glasser can serve us in the future to find the highest quality form of organization of teaching, and one way could certainly be reducing the number of students in classes, or increase the number of class which is perhaps a key move for the better functioning of the educational system, teaching and school in general.

Literature

1. *Dunđerović R, Radovanović I, Levi S. Upravljanje razredom. Beograd: Učiteljski fakultet, 2009.*
2. *Glaser W. Kvalitetna škola, Educa, Zagreb, 1994.*
3. *Glaser W. Nastavnik u kvalitetnoj školi, Educa, Zagreb, 1999.*
4. *Glasser W. Teorija izbora, nova psihologija osobne slobode. Zagreb: Alinea, 2000.*
5. *Ilić M. Od tradicionalne do kvalitetne škole. Banja Luka: Radovi, br. 1, 1998.*
6. *Ješić D. Sticanje kompetencija za nove uloge nastavnika u savremenoj školi i školi budućnosti, Časopis za društvene i prirodne nauke Svarog br.1, Pregledni članak UDK 371.311.5, 2010.*
7. *Klaić Ž. Rječnik stranih riječi, Nakladni zavod Matice hrvatske, 2004.*
8. *Kostović S. Nastavnik i upravljanje mikropedagoškim procesima. (ur). Kamenov E. Reforma vaspitanja i obrazovanja u Republici Srbiji. Novi Sad: Filozofski fakultet, 2006.*
9. *Kudumovic M, Krsmanovic S, Kudumovic D. New Technologies and new Information System effect the design of whole organization. TTEM, 2006; 1(1): 6.*
10. *Lasić K. Uloge nastavnika u tradicionalnoj i kvalitetnoj školi, Pregledni znanstveni članak UDK 37.014.5*
11. *Mustafičić N. Verbalna i neverbalna komunikacija kao najznačajniji faktor u kvalitetnoj interakciji učenik-nastavnik, 8. Naučno - stručni skup sa međunarodnim učešćem "KVALITET 2013" Neum, B&H, 06 – 08. juna 2013.*
12. *Stevanović M. Kvalitetna škola i stvaralaštvo, Tonimir, Varaždinske toplice, 2001.*
13. *Stoll L, Fink D. Mijenjamo naše škole: Kako unaprijediti djelotvornost i kvalitetu škola. Zagreb: Educa, 2000.*
14. *Vlahović B, Vujsić-Živković N. Nastavnik: Izazovi profesionalizacije, Beograd: Eduka, 2005.*
15. *Vukasović A. Pedagogija, Samobor, Zagreb, 1991.*
16. *Vukoje J. Osnovne funkcije savremene porodice, Nezavisni univerzitet Banja Luka, Pregledni rad UDK 316.356.2 DOI 10.7215/SVR1204137V Naučno - stručni časopis SVAROG br. 4, maj 2012; 137–144.*

17. *Zrilić S. Kvaliteta komunikacije i socijalni odnosi u razredu, Pedagogijska istraživanja, 7 (2), 231 – 242 Odjel za izobrazbu učitelja i odgojitelja, Sveučilište u Zadru, UDK 37.064, 2010.*

Corresponding Author
Adisa Milic,
University of Sarajevo,
Faculty of Education,
Sarajevo,
Bosnia and Herzegovina,
E-mail: balkanjournal@yahoo.com

Instructions for the authors

All papers need to be sent to e-mail: balkanjournal@yahoo.com

Preparing the camera ready paper for Balkan Journal of Health Science

First Author[1], Second Author[2], Third Author[3]

[1] First affiliation, City, Country,
[2] Second affiliation, City, Country,
[3] Third affiliation, City, Country.

Abstract

In this paper the instructions for preparing camera ready paper for the Journal are given. The recommended, but not limited text processor is Microsoft Word. Insert an abstract of 50-100 words, giving a brief account of the most relevant aspects of the paper. It is recommended to use up to 5 keywords.

Key words: Camera ready paper, Journal.

Introduction

In order to effect high quality of Papers, the authors are requested to follow instructions given in this sample paper. Regular length of the papers is 5 to 12 pages. Articles must be proofread by an expert native speaker of English language. Can't be accepted articles with grammatical and spelling errors.

Instructions for the authors

Times New Roman 12 points font should be used for normal text. Manuscript have to be prepared in a two column separated by 5 mm. The margins for A4 (210×297 mm2) paper are given in Table 1.

Table 1. Page layout description

Paper size	A4
Top and Bottom margin	20 mm
Left margin	20 mm
Right margin	18 mm
Column Spacing	5 mm

Regular paper may be divided in a number of sections. Section titles (including references and acknowledge-ment) should be typed using 12 pt fonts with **bold** option.

For numbering use Times New Roman number. Sections can be split in subsection, which should be typed 12 pt *Italic* option.

Figures should be one column wide. If it is impossible to place figure in one column, two column wide figures is allowed. Each figure must have a caption under the figure. For the figure captions 12 pt *Italic* font should be used. (1)

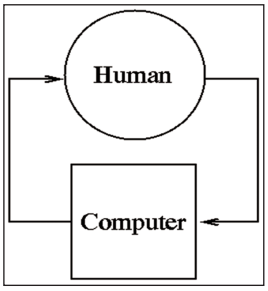


Figure 1. Text here

Conclusion

Be brief and give most important conclusion from your paper. Do not use equations and figures here.

Acknowledgements (If any)

These and the Reference headings are in bold but have no numbers.

References

1. *Sakane T, Takeno M, Suzuki N, Inaba G. Behcet's disease. N Engl J Med 1999; 341: 1284-1291.*
2. *Stewart SM, Lam TH, Beston CL, et al. A Prospective Analysis of Stress and Academic Performance in the first two years of Medical School. Med Educ 1999; 33(4): 243-50.*

Corresponding Author
Name Surname,
Institution, City,
Country,
E-mail