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Effectiveness of Using Video of Physical Exercises in Adults with Balance Problems: A Preliminary Report

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Abstract

Introduction: Humans require an intact balance system to pursue daily activities. Someone with balance disorders may face difficulties even in performing simple activities such as standing, walking, running etc. This may affect the overall quality of life of the sufferers. Worldwide, it is evident that around 40% of general population suffer from balance difficulties. Treating balance problems is challenging and having an effective rehabilitation tool is helpful.

Objective: This study was conducted to determine the effectiveness of performing specific physical exercises by balance disordered patients using a video guided method. This video module was recently developed by Zainun (2008), based on the Customized Cawthorne-Cooksey Exercise (CCCE) by Marousa et.al (2007).

Setting: Hospital of Universiti Sains Malaysia (HUSM).

Subject: Two patients with balance difficulties (mean age of 46.5 ± 3.5 years) who visited the Otorhinolaryngology Clinic of HUSM.

Method: Intensive clinical tests were performed on the patients, including the Malay Version of Vertigo Symptom Scale (MVVSS) and self-report. Following the diagnosis, the patients underwent structured physical exercises using the video module. After 2 months of intervention, their balance status was reassessed using the MVVSS and self-report.

Results: In general, following the intervention, patients felt that their symptoms had reduced significantly. Scores of MVVSS showed some improvement ranging from 13% to 18%, as compared to pre-intervention condition.

Conclusions: This study demonstrates that the video of physical exercises is beneficial to some patients with balance disorders. Their symptoms seem to improve quite rapidly. It is hoped that with a continuous guided exercise, the balance disordered sufferers may achieve a full recovery from their symptoms.

KeyWords: Balance, Vestibular, Physical Exercise, Rehabilitation, Video, Customized Cawthorne-Cooksey.

Among the types of physical exercise, the CCCE seems to be more effective and tends to cover a wider range of disease. As a consequence, a modified video module of CCCE was recently developed by Zainun [21]. Using Malay language, this video module consists of 19 physical exercises or movements, similar to the original version of CCCE [11]. It is divided into three main components: eye and head movements, positioning and postural controls. This is a home-based therapy where the patients are instructed to perform the exercises in a systematic manner to achieve the desired recovery.

In order to demonstrate the effectiveness of performing this video-guided exercise by Malay patients, this paper presents two case studies that worth a glance. If this therapy method is found to be beneficial, managing vestibular cases among Malay population will be more convenient.

2. Methodology

Two eligible subjects who visited the Otorhinolaryngology Clinic, Hospital of Universiti Sains Malaysia were selected in this study. They underwent a series of balance and audiological assessments that include Dix-Hallpike, Fukuda, Romberg, Straight Line, Videonystagmography (VNG), Vestibular Evoked Myogenic Potential (VEMP) and Pure Tone Audiometry (PTA) tests.

In the Dix-Hallpike test, subjects' eye movement (nystagmus) was investigated following certain movements. Having a positive outcome suggests an abnormality of posterior part of semicircular canals. While the Fukuda test examines the subjects' ability to step in place for 20-30 seconds. If they rotate, a unilateral loss of vestibular organ is suspected. The Romberg test, on the other hand, was performed to determine whether the subjects were able to maintain their standing position with eyes open and closed. The outcome is considered positive if they show some tendency to fall. The Straight Line test was carried out to determine the subjects' ability to walk in a straight line with eyes open and closed. If the subjects show some tendency to fall, the result is positive.

VNG test is a much more comprehensive assessment to measure the functions of vestibular system. It consists of several subtests such as Caloric, Saccade, Smooth-pursuit and Optokinetic. The Caloric test, for instance, measures the integrity of lateral part of semicircular canals. To achieve this, canals were irrigated with water or air that is 7°C above or below body temperature. This action stimulates the lateral canal and causes nystagmus. The pattern of nystagmus was recorded using a special goggle worn by the subjects.

VEMP is an electrophysiological test to measure the status of otolith organ (i.e. saccule) that is responsible to maintain the body equilibrium in linear movements. Electrodes were placed at four specific locations: forehead, middle part of sternocleidomastoid (SCM) muscle and upper edge of sternum (Figure 1). Once the subject was ready, clicks stimuli were presented to each ear monaurally at 90 dB nHL intensity level via headphones. During the recording, she was instructed to tense the SCM muscle by turning her head towards the non-test ear accordingly.

In addition, to gain information regarding the severity of patients' difficulties subjectively, the subjects were also asked to fill in the Malay Version Vertigo Symptom Scale (MVVSS) questionnaire (Appendix 1). This questionnaire was adopted from the Vertigo Symptom Scale (VSS) by Yardley [28] and had been translated into Malay version and validated accordingly (16).

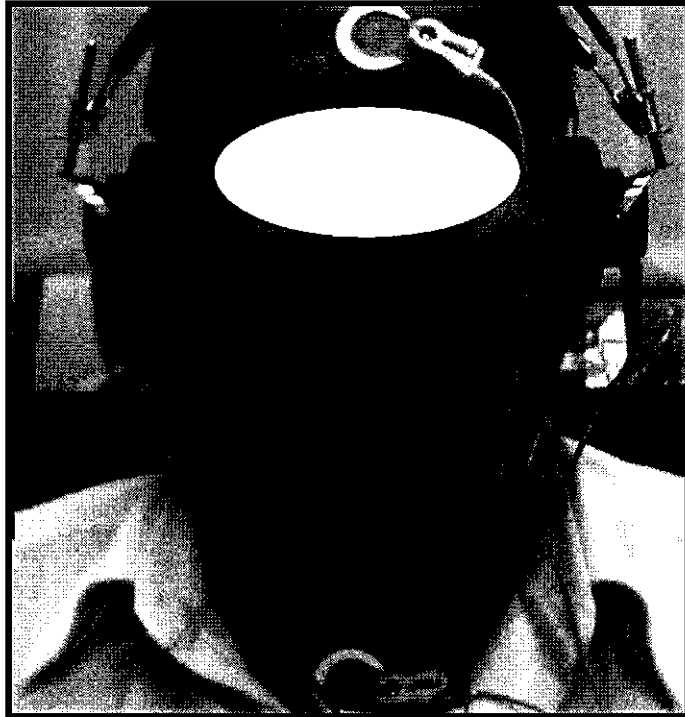


Figure 1: Electrodes placement for the Vestibular Evoked Myogenic Potential (VEMP) testing

3. Subject's Descriptions

Case A

ZAR is a 44-year old female who suffered from severe non-positional vertigo (for the past 6 months , fullness in her left ear, nausea and vomiting. When the attack is present, it may last in 2-3 days time. No significant history of hearing loss, tinnitus high fever, infections and head trauma reported. Final examinations revealed that this patient suffered from an acute vestibular neuritis.

Case B

SL is a 49-year old female who suffered from vertigo (sudden in nature and lasts a few seconds in each attack) since 3 years ago, severe unsteadiness, nausea and vomiting. No significant history of hearing loss, tinnitus, and fullness in the ear, high

fever, infections and head trauma reported. Final examinations revealed that she suffered from a poorly compensated vestibular disorder (PCPVD).

4. Results

a) Pre-intervention Assessments

Case A

Most of the outcomes from the clinical assessments were found to be unremarkable. That is, normal findings were noted in the Dix-Hall pike test, Fukuda test, Romberg test and Straight Line test. Caloric test, Smooth-pursuit, Saccade and Pure Tone Audiometry (PTA) test were also found to be normal.

In contrast, while her VEMP waveform was normal in the left side (Figure 2), it was found to be small and almost flat in the right side, as shown in Figure 3. The flat result is considered to be 'pathological' because the patient had given maximum efforts to tense her right SCM muscle during the recording.

The outcome from the MVVSS showed that her difficulty was at a moderate level (score of 30 out of 136). This is consistent with her self-report where the balance difficulty affects her life tremendously.

Case B

Most of clinical balance assessments were found to be normal, except that she fell while undergoing the Romberg test (with eyes closed). Caloric test was also found to be normal. However, her performance was abnormal in smooth-pursuit, saccade and VEMP testing. The VEMP waveform was abnormal in her left side with some delay in P1 latency (Figure 4). Her VEMP findings were normal in the right side (Figure 5).

Her MVVSS score was 47/136 and this indicated that her current balance status was in a moderate level. This is also consistent with her self-report.

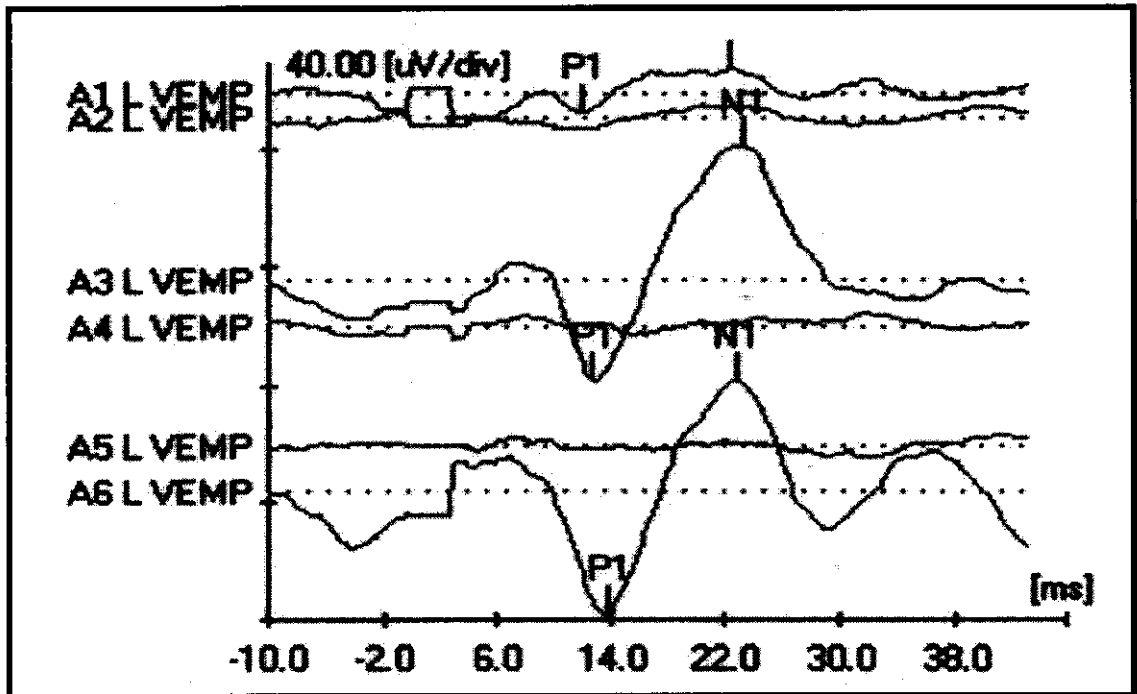


Figure 2: VEMP waveforms of left side for Case A

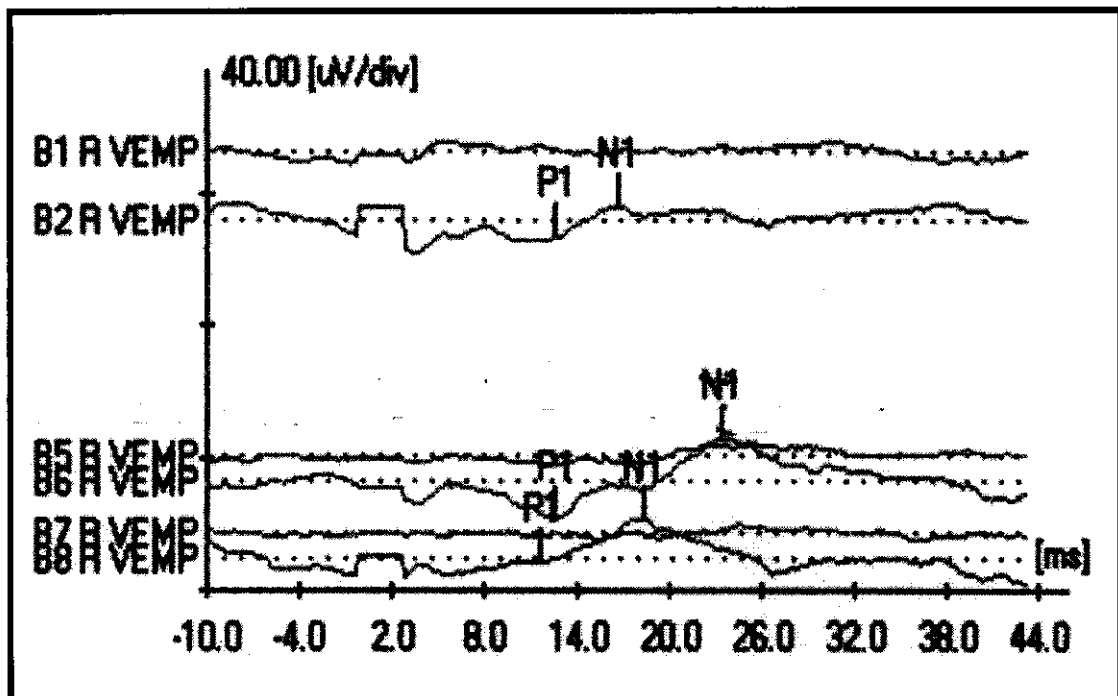


Figure 3: VEMP waveforms of right side for Case A

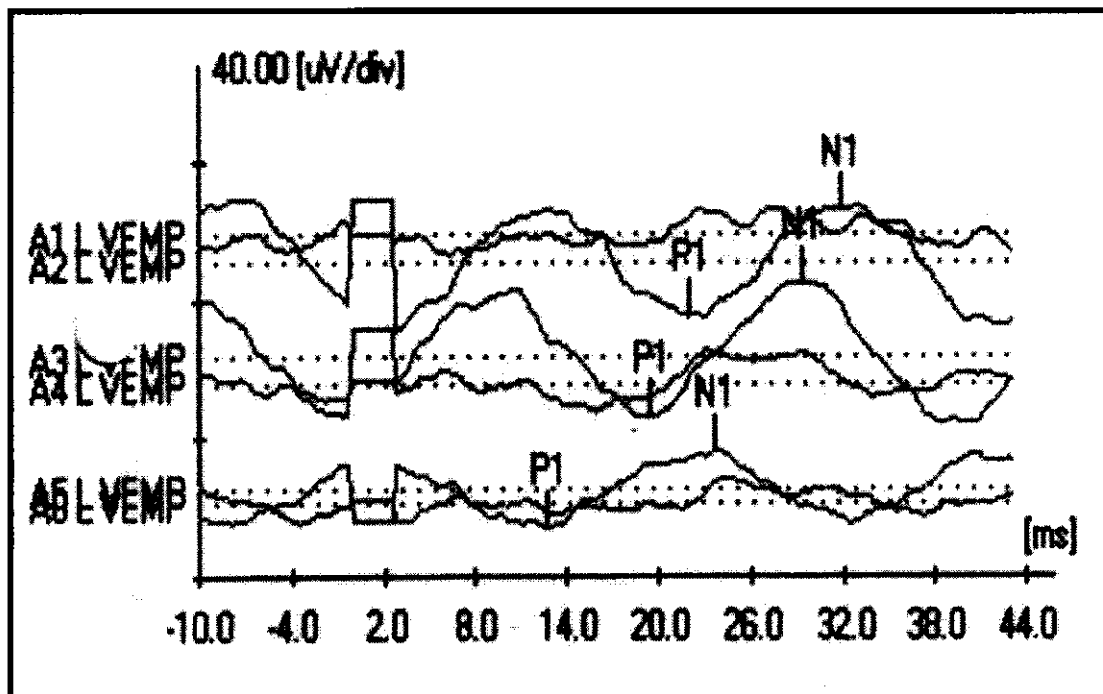


Figure 4: VEMP waveforms of left side for Case A

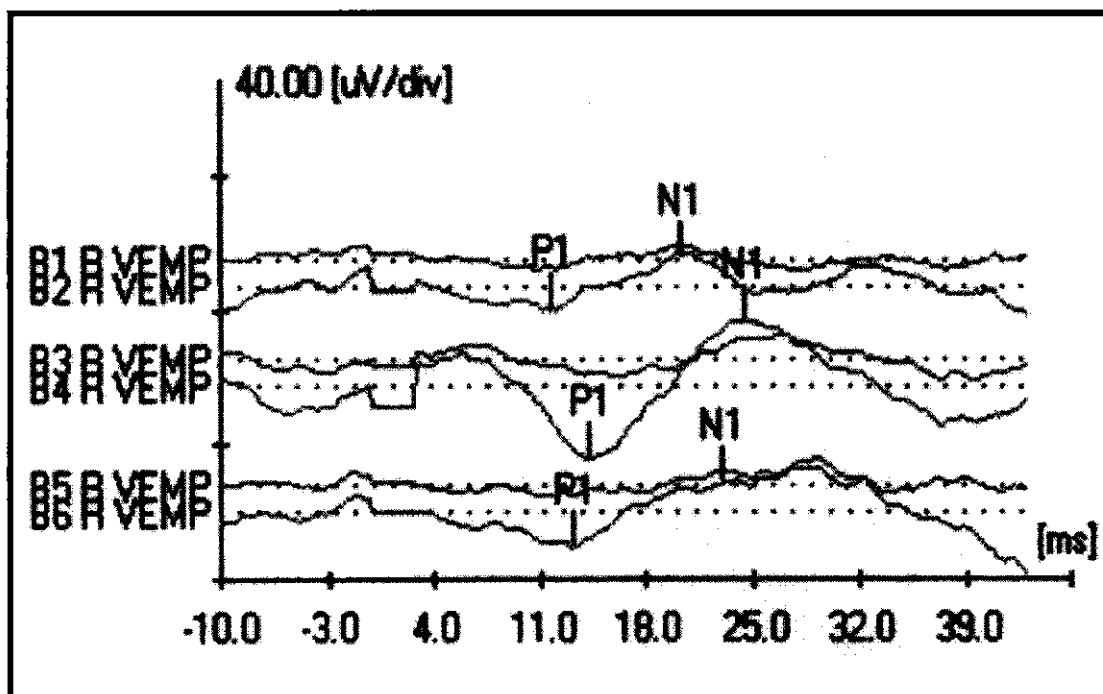


Figure 5: VEMP waveforms of left side for Case B

b) Intervention

Following the diagnosis, the subjects underwent the structured physical exercises accordingly using the video module of CCCE by Zainun [21] that consists of 19 different movements (Figure 6). Patients were instructed to follow all the exercises in a step by step manner. They were asked to repeat each exercise for 20 times, at least four times per day. They were also required to report their progress on the sheets provided (Appendix 2). That is, they were instructed to score and record their treatment progress before, while and after the exercise. Each subject was reminded to follow the instructions accordingly to achieve the desired recovery.

Betahistine tablet (16 mg three times per day) was also prescribed as part of typical medical management. After 2 months of intervention, their balance status was reassessed using the MVVSS and self-report of their current symptoms.

c) Post-intervention Assessments

After 2-months of therapy, the subjects' conditions were reassessed. That is, the severity of their current symptoms such as vertigo, nausea, vomiting, unsteadiness, fullness of the ear, number of attacks and related symptoms were re-evaluated following the therapy. In this paper, only the MVVSS and self-report outcomes were presented.

In general, great improvements were noted in both subjects. For Case A, subject ZAR felt that her balance difficulties have improved significantly (about 80% improvement), as compared to her pre-intervention condition. She claimed that she faced less unsteadiness, nausea and vomiting problems. Her MVVSS score also revealed some improvement that is consistent with her self-report (her pre-intervention score was 30/136 and the post-intervention score was 5/136). In term of percentage, it was found that her balance problems have improved about 18%, after undergoing the 2 months vestibular rehabilitation.



Figure 6: Front layout of video module of vestibular rehabilitation by Zainun (2008)

For Case B, subject SL reported that her post-intervention condition was much better than the pre-therapy condition. She claimed that she faced less attacks of vertigo (only 2 times), no nausea or vomiting problems. The MVVSS test also revealed some improvement; her post-therapy score was 29/136, as compared to pre-intervention score of 47/136. That is, after performing the video-guided physical exercises for 2 months, an improvement of about 13% was noted in her condition.

5. Discussions

This study presents the effectiveness of having the video-guided exercise to treat patients with balance disorders. In general, following the 2 months video-guided vestibular rehabilitation, both subjects show some improvements, based on their current symptoms and scores of MVVSS. The symptoms of balance disorders such as vertigo, nausea, vomiting and unsteadiness were found to be less disturbing tremendously, as indicated by their self-reports. Subject ZAR (Case A), for instance, felt that her post-intervention condition was about 80% better than her pre-intervention stage. This

suggests that the modified video module is beneficial and effective to reduce the vestibular symptoms.

The MVVSS scores for post-intervention condition also showed some improvement in both subjects, as compared to pre-intervention scores. This seems to be consistent with their self-reports. However, the percentage improvement for Subject ZAR (Case A) and SL (Case B) was 18% and 13%, respectively. These values are actually lower than the one in the self-report (80% for Case A). The possible reason for this discrepancy is that the self-report measures the patients' general symptoms (e.g. balance and vestibular disorders) but the MVVSS is more specific and covers three main categories: vertigo, somatic-anxiety and autonomic arousal. The MVVSS, nevertheless, has been used commonly in other studies to assess the patients' current clinical status and document the treatment progress [17, 22-25].

The outcomes from this study are in line with a previous study that employed similar exercises without the video-guided method [11]. They are also consistent with a study by Wiorowski et al. [27], who found a good recovery effect with immediate physical vestibular rehabilitation in patients with vestibular disorders.

Having the video-guided exercise serves several advantages in treating patients with balance problems. First, since all the physical exercises were recorded accordingly, clinicians may play "less" roles in demonstrating each step of the exercises to the patients (this will provide them with more time to perform other important diagnostic procedures). Second, since this is a home-based therapy, the patients are able to follow and practise the exercises comfortably and properly with minimal errors. Third, it may also help in reducing excessive appointments in clinics that offer vestibular services. Finally, it may also help to reduce the burdens of patients and their family members as they are required to visit the hospital for treatment in a frequent manner.

6. Conclusion

To conclude, this study demonstrates that the video of physical exercises is beneficial to some patients with balance disorders. That is, having an effective video-

guided exercise is an advantage to treat patients with balance disorders. This may reduce the workload by the professionals involved and can be cost-effective for patients in a long run. It is hoped that with the continuous use of this rehabilitation method, patients will achieve an optimum recovery from their symptoms, as well as a better quality of life.

Acknowledgment

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Appendix 1: Malay Version of Vertigo Symptom Scale

SKALA SIMPTOM 'VERTIGO' OLEH YARDLEY 1992

Setiap soalan hendaklah di jawab berdasarkan skala 0-4.

Nilai bagi setiap respon ialah :

| 0 | 1 | 2 | 3 | 4 |
|--------------|-----------------------------------|--------------------------------|--|---|
| Tidak Pernah | Beberapa kali (1-3 kali setahun) | Banyak kali (4-12 kali Setahun | Agak kerap (secara purata lebih dari sekali dalam sebulan) | Sangat kerap (secara purata lebih dari sekali dalam seminggu) |

Berapa kerapkah anda mengalami simptom (gejala) dibawah:

- Perasaan seolah-olah benda atau keadaan sekeliling berpusing atau bergerak, selama : (sila jawab semua kategori)
 - kurang dari dua minit 0 1 2 3 4
 - sehingga 20 minit 0 1 2 3 4
 - 20 minit hngga satu jam 0 1 2 3 4
 - Beberapa jam 0 1 2 3 4
 - Lebih dari 12 jam 0 1 2 3 4
- Sakit di bahagian jantung atau dada 0 1 2 3 4
- Serangan rasa panas atau sejuk 0 1 2 3 4
- Ketidakseimbangan badan yang melampau sehingga menyebabkan anda terjatuh 0 1 2 3 4
- Loya, perut memulas 0 1 2 3 4
- Kejang atau sakit pada otot-otot 0 1 2 3 4
- Perasaan berasa pening-pening lalat, terapung-apung atau 'giddy', selama: (sila jawab semua kategori)
 - kurang dari dua minit 0 1 2 3 4
 - sehingga 20 minit 0 1 2 3 4
 - 20 minit hngga satu jam 0 1 2 3 4
 - Beberapa jam 0 1 2 3 4
 - Lebih dari 12 jam 0 1 2 3 4
- Menggigil, menggeletar 0 1 2 3 4
- Berasa telinga tersumba 0 1 2 3 4
- Berasa jantung berdegup atau berdebar-debar 0 1 2 3 4
- Muntah 0 1 2 3 4
- Berasa berat pada lengan atau kaki 0 1 2 3 4

| | | | | | | |
|-----|--|---|---|---|---|---|
| 13. | Gangguan penglihatan (contoh: gangguan bayangan mata semasa melihat sesuatu objek) | 0 | 1 | 2 | 3 | 4 |
| 14. | Sakit kepala atau berasa berat dalam kepala | 0 | 1 | 2 | 3 | 4 |
| 15. | Tidak dapat berjalan atau berdiri dengan baik tanpa bantuan | 0 | 1 | 2 | 3 | 4 |
| 16. | Kesukaran untuk bernafas, bernafas dengan tercungap-cungap | 0 | 1 | 2 | 3 | 4 |
| 17. | Hilang tumpuan atau ingatan | 0 | 1 | 2 | 3 | 4 |
| 18. | Berasa hilang keseimbangan badan sehingga ingin terjatuh, berpanjangan (sila jawab semua kategori) : | | | | | |
| | a) kurang dari dua minit | 0 | 1 | 2 | 3 | 4 |
| | b) sehingga 20 minit | 0 | 1 | 2 | 3 | 4 |
| | c) 20 minit hingga satu jam | 0 | 1 | 2 | 3 | 4 |
| | d) Beberapa jam | 0 | 1 | 2 | 3 | 4 |
| | e) Lebih dari 12 jam | 0 | 1 | 2 | 3 | 4 |
| 19. | Berdenyut-denyut, mencucuk-cucuk atau kebas di bahagian badan tertentu | 0 | 1 | 2 | 3 | 4 |
| 20. | Sakit pada bahagian bawah belakang | 0 | 1 | 2 | 3 | 4 |
| 21. | Berpeluh berlebihan | 0 | 1 | 2 | 3 | 4 |
| 22. | Perasaan ingin pitam, hampir pingsan | 0 | 1 | 2 | 3 | 4 |

Appendix 2: BORANG CATATAN PERKEMBANGAN REHABILITASI VESTIBULAR

Nama: _____ Umur: _____

Jantina: L / P Penyakit: _____

Tarikh mula penyakit: / /

| Bahagian 1 : Latihan Koordinasi pergerakan kepala dan mata | |
|---|---|
| 1 | Gerakkan kepala ke belakang dan ke depan atau dari kanan ke kiri dengan atau tanpa fokuskan mata setempat pada objek yang tetap atau objek bergerak |
| 2 | Tambahkan kelajuan pergerakan, jarak dari objek atau sasaran fokus dan gunakan objek berlainan (kad perniagaan, papan tanda dan baju bercorak) |
| Bahagian 2 : Latihan 'Positioning' (lakukan dengan mata terbuka dan tertutup) | |
| 1 | Tundukkan badan ke bawah sambil tangan menyentuh lantai dari keadaan duduk dan berdiri |
| 2 | Tundukkan badan ke bawah sambil berpusing ke kiri atau ke kanan |
| 3 | Lihat bahu kiri dan kanan |
| 4 | Baring dan berpusing daripada satu sisi kanan ke sisi kiri |
| 5 | Daripada posisi baring ke posisi duduk |
| Bahagian 3 : Latihan 'Postural' (lakukan dengan mata terbuka dan tertutup) | |
| 1 | Berdiri dengan kaki tertutup rapat tanpa berpegang atau dengan bantuan luar |
| 2 | Pemindahan berat badan daripada kaki kanan ke kaki kiri secara bergilir-gilir / dari tumit ke ibujari kaki |
| 3 | Letakkan objek di lantai dan cuba sentuh objek tersebut dalam keadaan berdiri dengan kaki terbuka luas / kaki tertutup rapat |
| 4 | Berdiri di atas sebelah kaki sahaja |
| 5 | Berdiri tegak/kawat (angkat kaki dan pastikan lutut selari dengan aras paha)/ pusingkan badan dan kepala sekali secara berterusan ke kanan dan ke kiri semasa anda berada di atas bantal atau pelapik kerusi yang lembik (permukaan yang tidak rata) |

| | |
|----|--|
| 6 | Berjalan ke hadapan dengan perlahan dan pastikan hujung jari kaki dan tumit dari kaki yang lain rapat / berjalan biasa |
| 7 | Berjalan ke sisi (kanan dan kiri) |
| 8 | Berjalan di atas permukaan yang tidak sekata seperti berjalan di atas pasir atau sebagainya |
| 9 | Berjalan sambil membentuk nombor lapan , bulatan atau pusingan yang tajam |
| 10 | Mendaki tangga ke atas dan ke bawah (ketinggian yang berbeza) |
| 11 | Lakukan pergerakan kepala ke depan dan ke belakang dan ke kanan dan ke kiri dengan atau tanpa fokus pada sesuatu benda atau objek dalam posisi duduk hinggalah berdiri dan sambil berjalan |
| 12 | Berjalan sambil melihat sisi bahu kanan dan kiri secara bergilir-gilir |

SKALA SIMPTOM SEMASA

(Benda, keadaan sekeliling atau badan berpusing atau bergerak, muntah, loya, hilang keseimbangan badan)

| | | | |
|--------------|------------------|-------------------|---------------------|
| 0 | 1 | 2 | 3 |
| Tiada | Sederhana | Agak kerap | Sangat teruk |

| Bahagian 1 : Latihan Koordinasi pergerakan kepala dan mata | | | | |
|---|--------------------|---|---------------------|-----------------------------|
| Latihan | Tarikh Mula | Keadaan semasa (0-3) Sila nyatakan simptom: muntah, loya dll | Tarikh Tamat | Keadaan semasa (0-3) |
| 1 | | | | |
| 2 | | | | |
| Bahagian 2 : Latihan 'Positioning' (lakukan dengan mata terbuka dan tertutup) | | | | |
| Latihan | Tarikh Mula | Keadaan semasa (0-3) Sila nyatakan simptom: muntah, loya dll | Tarikh Tamat | Keadaan semasa (0-3) |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| | | | | |

SKALA SIMPTOM SEMASA

(Benda, keadaan sekeliling atau badan berpusing atau bergerak, muntah, loya, hilang keseimbangan badan)

| | | | |
|--------------|------------------|-------------------|---------------------|
| 0 | 1 | 2 | 3 |
| Tiada | Sederhana | Agak kerap | Sangat teruk |

| Bahagian 3 : Latihan 'Postural' (lakukan dengan mata terbuka dan tertutup) | | | | |
|--|--------------------|---|---------------------|-----------------------------|
| Latihan | Tarikh Mula | Keadaan semasa (0-3) Sila nyatakan simptom: muntah, loya dll | Tarikh Tamat | Keadaan semasa (0-3) |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |

**SUSUNAN ACARA SIMPOSIUM KEBUDAYAAN INDONESIA-MALAYSIA (SKIM) XI
DI BANDUNG, 10, 11 DAN 12 NOVEMBER 2009**

HARI PERTAMA, SELASA, 10 NOVEMBER 2009

Tempat Graha Sanusi Hardjadinata

PEMBUKAAN DAN JAMUAN MAKAN MALAM

- | | |
|-------|--|
| 15.00 | 1. Registrasi |
| 16.00 | 2. Proseksi Kesenian Oleh Mahasiswa Malaysia yang sedang belajar di UNPAD |
| | 3. Sambutan Rektor UNPAD |
| | 4. Sambutan Naib Canselor UKM |
| | 5. Peresmian SKIM XI dengan memainkan angklung bersama |
| | 6. <i>Keynote Speech</i> Jenderal (Purn) Try Sutrisno (<i>Chairman, Eminent Persons Group</i> Indonesia – Malaysia) |

Halaman Depan Kampus Iwa Koesoemasoemantri

- | | |
|-------|---|
| 19.00 | 1. Jamuan Makan Malam oleh Rektor Universitas Padjadjaran |
| | 2. Ramah Tamah dan Hiburan |

HARI KEDUA, RABU 11 NOVEMBER 2009

Tempat Graha Sanusi Hardjadinata
Pukul 08.00 – 09.30

**PEMBICARA KEHORMATAN KE-1:
PEMBANGUNAN UNTUK KESEJAHTERAAN DAN PERDAMAIAN PENGALAMAN INDONESIA-MALAYSIA**

Rektor Institut Teknologi Bandung
Rektor Universitas Pendidikan Indonesia

Chair: Prof. Dr. Ir. Ganjar Kurnia, DEA, Rektor Universitas Padjadjaran

Pukul 09.30- 10.00 : Istirahat

DISKUSI PARALEL

SESI 1, Pukul 10.00 – 12.00

| SUB TEMA | TOPIK/SUBTOPIK | TEMPAT | MAKALAH | PRESENTER |
|-------------|--|------------------------------|---|--|
| 1 | Demokrasi untuk Kesejahteraan dan Perdamaian Moderator: Yanyan M.Yani, Ph.D | Ruang Grompol (L.201) | 1. Ideologi dan Kekuasaan Komersial Dalam Proses Penciptaan Program Siaran Televisi di Indonesia | Agus Firmansyah, S.Sos Dr. Indrawadi Tamim, M.Sc (Universitas Indonusa Esa Unggul Jakarta) |
| | | | 2. Demokrasi, Perempuan, dan Pemilu 2009 | Dr. Samugyo Ibnu Redjo (FISIP UNPAD) |
| | | | 3. Demokrasi, Perempuan dan Partisipasi Politik | Dr. Tati Rukminijati (FISIP UNPAD) |
| | | | 4. Konsep Jihad Di Kalangan Kumpulan Gerakan Agama Radikal Malaysia-Indonesia: Satu Penelitian Kritis | Prof Madya Mostafa Kamal Mokhtar Azmi Aziz (UKM) |
| | | | 5. Kemelesetan Ekonomi Dunia 1929-1935: Kadar Jenayah dan Kesannya Kepada Perdamaian dan Kesejahteraan di Pulau Jawa | Dr. Nazarudin Zainun (USM) |
| 2 | Stabilitas Politik dan Hukum Moderator: M. Rizal, M.Hum | Ruang Ganggeng (L.202) | 1. Aspek Hukum dalam Pemanfaatan Ekspresi Budaya Tradisional Sebagai Komoditas Perdagangan Jasa Pariwisata Budaya | Laina Rafianti, SH., MH (FH Unpad) |
| | | | 2. Pengaruh Globalisasi terhadap Pembangunan Sistem Hukum Nasional | Dr. Nandang Alamsah D., SH., M.Hum (FISIP UNPAD) |
| | | | 3. Stimulus Fiskal Berbasis Pemberdayaan Masyarakat sebagai Upaya Kreatif Mengurangi Kemiskinan dan Pengangguran | Alvenra Muly, SH.,MH (FH Unpad) |
| | | | 4. Penguatkuasaan Undang-Undang bagi Kes-Kes Kesalahan Matrimoni Menurut Enakmen Undang-Undang Keluarga Islam di Malaysia | Prof. Madya Dr. Zaini Nasohah Prof. Madya Dr. Amir Husin Mohd Nor Prof. Madya Mohd Nasran Mohamad (UKM) |
| | | | 5. Keperluan Makanan dan Minuman Halal dalam Industri Penerbangan Di Malaysia dan Indonesia | Dr. Jasri Jamal, Prof Dr Kamal Halili Hassan, Dr Rohani Abdul Rahim, Prof. Madya Dr. Zinatul Ashiqin Zainol, Dr Rooshida Merican Abdul Rahim Merican, Dr. Che Norlia Mustafa, Wan Siti Adibah Wan Dahalan, Annalisa Yahanan, Norsuhaida Che Musa (UKM) |
| | | | 6. Perancangan kerajaan British terhadap masa depan Tanah Melayu selepas Perang Dunia Kedua | Mohd. bin Samsudin (UKM) |

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| 3a | Stabilitas Ekonomi Moderator: Ria Arifianti, S.IP., M.Si. | Ruang Mega Mendung (L.203) | 1. <i>Web</i> sebagai Media Pemasaran yang Dinamis dan Atraktif Menghadapi Persaingan Usaha yang Semakin Kompetitif | Arief Wibowo |
| | | | 2. Effective Financing Models for the Ceramic Industry Center in Plered, West Java | Elizabeth T. Manurung Rosita Widjojo Syvia Fettry E.M. (Universitas Parahyangan) |
| | | | 3. Investment Policy as One of the Tools to Mitigate Climate Change | Kandi Sofia S. Dahlan, Ph.D (FE, Unpad) |
| | | | 4. Mempakej Pelancongan Tasik Chini sebagai Rizab Biosfera | Dr Habibah Ahmad Prof Dr Mushrifah Idris Prof Madya Dr Hamzah Jusoh Ari Kurnia (UKM) |
| | | | 5. The Power of Customer Relationship Management (CRM) in Enhancing the Ability to Fulfill Customers' Changing Needs | Prof Dr Arawati Agus (GSB UKM) |
| | | | 6. Indeks Modal Sosial dan Agihan Pendapatan Isi Rumah | Mohd. Nasir Mohd. Saukani Prof Dr Rahmah Ismail Prof Madya Ishak Yussof (UKM) |
| | | | 7. Dari Pasar Malam Ke Pasar Besar: Transformasi Perekonomian Masyarakat Cam Di Kelantan | Farid Mat Zain Prof Madya Dr Mohammad Zain Musa Prof Madya Dr Fatimah Abdullah (UKM) |
| 3b | Stabilitas Ekonomi Moderator: Benny Alexandri, SE., MM | Ruang Kawung (L.204) | 1. Implementasi <i>Asean Free Trade Agreement</i> Dalam Perdagangan Komoditas Pertanian (Studi Kasus Di Jawa Barat) | Dr. H. Obsatar Sinaga, Drs., M.Si. (FISIP UNPAD) |
| | | | 2. Corak Pembelanjaan Pelancong dari Asia Barat dan Kesan Terhadap Ekonomi Malaysia | Dr Norlida Hanim Mohd Salleh Prof Madya Dr Redzuan Othman Prof Dr Mohd Safar Hasim Nor Azizah Romley (UKM) |
| | | | 3. Analisis Kesan Insentif Industri Pelancongan Terhadap Kualiti Taman Laut Di Pulau Tioman | Prof Madya Dr Redzuan Othman, Dr Norlida Hanim Mohd Salleh Jirsah A.Bakar Kuncho Dr Tamat Sarmidi (UKM) |

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|---|---|-----------------------------|---|---|
| | | | 4. Dynamic inter-relationship between tourism, trade and economic growth in Malaysia | Dr Tamat Sarmidi Dr Norlida Hanim Mohd Salleh Prof Madya Dr Redzuan Othman (UKM) |
| | | | 5. Tren Perkembangan Industri Sawit Indonesia – Malaysia: Dahulu, Kini dan Senario Masa Hadapan | Prof Madya Zaimah D. Mohd Noor M. Zahari Z Soon Jin L. (UKM) |
| | | | 6. Pembangunan Pelancongan Eko Lestari di Taman Laut Malaysia: Kajian Kes Taman Laut Pulau Tioman | Prof Madya Dr Redzuan Othman Dr Norlida Hanim Mohd Salleh (UKM) |
| | | | 7. The Concept Of Hypermarket Consumer Logistics And Its Application In Improving Sme Management In Malaysia | Norshaheeda M.N. Prof Madya Zaimah D. Mohd Noor M. (UKM) |
| 4 | Tata Kelola Pemerintahan, Politik Lokal dan Desentralisasi Moderator: Dr. Sam'un Jaja Raharja, M.Si. | Ruang Harjuno Manah (L.205) | 1. Inovasi, Orientasi Baru Otonomi Daerah di Indonesia | Caroline Paskarina, M.Si (FISIP UNPAD) |
| | | | 2. The Disharmony in the Implementation of Decentralization in Mining Sector in Indonesia | Ildrem Syafric, Ph.D Prof. Dr. Adjat Sudradjat (Geologi UNPAD) |
| | | | 3. The Role of Government in Preserving Intangible Cultural Heritage: Challenges and Future | Khairiah Salwa Mokhtar Noresah Mohd Shariff Zuraini Zakaria (Universiti Sains, Malaysia) |
| | | | 4. Perancangan Bandaraya Selamat (Safe City) Di Kota Kinabalu : Ke Arah Kewujudan Persekitaran Bandaraya Yang Lebih Selamat Didiami | Harifah Binti Mohd Noor Dr Aliakbar Gulasan (UMS) |
| | | | 5. Pilihan Raya Kecil Dun Penanti Tanpa BN: Analisis Calon, Isu Dan Kempen | Junaidi Awang Besar Prof Madya Dr Mohd Fuad Mat Jali (UKM) |
| | | | 6. Keefisienan Perkhidmatan: Perbandingan Pihak Berkuasa Tempatan di Wilayah Bandaraya Kuala Lumpur | Prof Madya Hamzah Jusoh Dr Habibah Ahmad (UKM) |