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RESEARCH ARTICLE

CLINICAL DECISION MAKING FOR USE OF ELECTRO-PHYSICAL AGENTS BY PHYSICAL-THERAPY INTERNS AND POST- GRADUATE STUDENTS OF AHMEDABAD, INDIA: A CROSS-SECTIONAL SURVEY.

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Abstract

Introduction: Electro-physical agents (EPA) are the electrical or thermal modalities used along with exercise therapy. The aim of the study was to understand the factors affecting the clinical decision making by newly practicing Physical-therapy Interns and Post-Graduate students, while choosing EPA as a part of treatment.

Method: A cross-sectional survey was conducted at Physical-therapy college. Hundred Physical-therapists doing internship or the master's program were included using convenience sampling. They were asked to fill a self-developed questionnaire regarding use of electro-physical agents.

Results: Out of 100 subjects, EPAs available to all were TENS, IFT, SWD, US, IR at their work- place, while LASER-94%, Cryotherapy-94%, EMG/NCV-93%, Contrast Bath-87%, UVR-86%, MWD-82%, Combination Therapy-81%, Shock-wave Therapy-78%, , Magneto-Therapy-76% and were available. Hydro therapy pool was unavailable to 65%. Frequently used EPAs were IFT-94%, US-92%, TENS-90%, ES-80%, Contrast Bath-67%, SWD-63%, ,Cryotherapy-56%, IR-52% a day. Factors which influence the use of EPAs the most were-background experiences, busy and tight schedule and availability of equipment. Another factor was technophobia, where half of people didn't have any fear of technology. And it was found that 52% were self- confident while operating any modality. But only 6% felt that patient preference is a very strong factor.

Conclusion: The survey shows a high availability and use of EPAs. Background and experience, busy and tight schedule, availability of equipment, degree of self- confidence operating the device, time and ease of application were the strong factors influencing their use.

Introduction:-

Electro-Physical Agents (EPA) are the electrical or thermal modalities, which are used along with exercise therapy. They provide therapeutical and physiological effects[1,2] by relieving pain, muscle spasm, healing of tissues, improving strength and many more. Not only EPAs are helpful in the treatment, but also to diagnose the condition.

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EPAs are considered an important part of treatment by Physical-therapists, as it works simultaneous to exercise therapy, and gives immediate results to patients. Various EPAs used in treatment are Ultra-sound (US), Transcutaneous Electrical Nociceptive Stimulation (TENS), Interferential Current (IFT), Contrast Baths, Short-wave Diathermy (SWD), Long-wave Diathermy (LWD), Neuro-muscular Electrical Stimulation (NMES), Light Amplification by Stimulated Emission of Radiations (LASER), Infra-red Rays (IR), Shock-wave Diathermy, Ultra-Violet Rays (UVR), Magneto-therapy, EMG/NCV- diagnostic agent, Micro-wave Diathermy (MWD), Contrast Bath, Combination Therapy, Hydrotherapy and Cryotherapy.

Selecting the most appropriate and effective treatment for the patients, depends on the clinical decision making skills of the Physical-therapists of clinically assessing, diagnosing, addressing the chief complaint of patient, determining therapeutic goals by selecting appropriate EPA for the patient with proper dosages [3]. Sometimes not only the treatment can be ineffective, even it could give some detrimental effects to patient's health[4].

This survey was done with respect to determine the clinical decision making factors which influences the Physical-therapists doing Internship or Master's program, to choose EPA for treatment.

Aim Of The Study:-

The aim of the study was to understand the factors affecting the clinical decision making by practicing Physical-therapists Interns and Post-Graduates, while choosing EPA as a part of treatment.

Methodology:-

A cross-sectional survey was conducted at Physical-therapy College, Ahmedabad. Hundred Physical-therapists Interns and Post-Graduate students, both males and females, of the college were included in the study by convenient sampling. Subjects not willing to participate were excluded. The participants were explained the study and written informed consent was obtained from them. A self-developed questionnaire, regarding availability and frequency of various EPAs and the various factors affecting the use of EPAs along with demographic details was asked to be filled by them. It took about 30 minutes to fill the questionnaire.

The self- developed questionnaire was prepared, whose content validity was examined through a rigorous, iterative process with Physical-therapy faculty involved in EPA education. The questionnaire was divided into three sections:-

The first section of the questionnaire included demographic data and the college where Physical-therapists studied his/her Bachelors and the area of practice.

The second section was mainly objective, which included availability and frequency of use of various EPAs.

The third section was purely subjective, as this part represented the actual clinical decision making skills of the Physical-therapists. It included the factors influencing the use of EPAs. This section included 6 factors, where the Physical-therapists had to score their strongest influencing factor from 0-4; where 0 means no influence and 4 means very strong influence. The first factor was about background experience, which included Under-graduate studies and training, continuing education and training background, previous clinical experience with EPAs and demonstration and exposure to new equipment by medical marketers. Second factor was about research evidence and efficacy of the EPA. Third factor was related to technology related issues, if one has techno-phobia, or fear of adverse effects. Fourth factor was related to availability of equipment during student life. Fifth factor was about operating the device, where Physical-therapists could describe the degree of self-confidence in operating the device, time and ease of application and busy and tight schedule at workplace. And the last factor which played a very important role in Physical-therapists decision was patient's preference to EPA and doctors preference to EPA.

Data Analysis was done using Microsoft Spreadsheet.

Results:-

Out of 100 subjects, 60 were Interns- where 25 Interns were from other colleges and rest 35 from the same college and 40 were doing Master's program. Male therapists were 11 and 89 female therapists. Their area of practice was - 22 in Neurological and paediatrics department, 25 in Orthopaedic department, 15 in Electro-therapy department, 12

in Rehabilitation department, 24 in cardio-pulmonary department and 2 in sports department. All the Physical-therapists were between of 21-25 years of age.

Table 1 shows the availability of EPA's and frequency of use.

Table 1:-Availability of EPA's and frequency of use

EPA	Availability (%)			Frequency of use (%)				
	Yes	NO	NOT SURE	ONCE A DAY	ONCE A WEEK	ONCE A MONTH	SELDOM	NOT AT ALL
HYDROTHERAPY	33	65	2	28	3	-	1	68
ELECTRICAL STIMULATION	100	-	-	80	16	2	2	-
TENS	100	-	-	90	7	1	1	1
IFT	100	-	-	94	5	-	1	-
CONTRAST BATH	87	13	-	67	14	-	3	16
SWD	100	-	-	63	12	12	4	9
MWD	82	17	1	10	8	8	29	45
COMBINATION THERAPY	81	15	4	41	7	12	11	29
ULTRA SOUND	100	-	-	92	5	-	3	-
LASER	94	6	-	26	16	14	21	23
INFRA-RED	100	-	-	52	33	8	5	2
UVR	86	10	4	20	7	15	17	41
SHOCK-WAVE THERAPY	78	19	3	19	17	11	12	41
CRYOTHERAPY	94	5	1	56	8	8	13	15
MAGNETO-THERAPY	76	24	-	39	8	7	11	35
EMG/NCV	93	6	1	21	3	8	28	40

The results from the above table shows that, out of 100 subjects, all had availability of TENS, IFT, SWD, US, IR at their work- place, while other EPAs such as LASER, Cryotherapy and EMG/NCV are available to more than 90% Physical-therapists. Other modalities such as Contrast Bath, UVR, MWD, NMES and Combination Therapy are available to more than 80% Physical-therapists; Shock-wave therapy and Magneto-therapy are available to more than 70% Physical-therapists. Hydro therapy pool was found to be unavailable to 65%.

The most frequently used EPA's were IFT, US, TENS, NMES, Contrast Bath, SWD, Cryotherapy, IR, at least once a day by more than 50% Physical-therapists. While MWD, UVR, Shock-wave, EMG/NCV were not at all used by 40-45% Physical-therapists. Hydrotherapy was not used by 68% Physical-therapists.

Table 2 shows the level of influence of various factors in deciding the use of EPA's

Table 2:-Level of influence of various factors in deciding the use of EPA's

FACTOR	LEVEL OF INFLUENCE				
	NONE (0)	SOME (1)	MEDIUM (2)	STRONG(3)	VERY STRONG(4)
1.Background and Experience					
1a) Entry level (undergraduate) studies & training background		1	6	35	58
1b) Continuing education studies & training		2	5	37	56
1c) Previous clinical experience with EPAs	2	6	9	33	50
1d) Demonstration and exposure to	36	22	21	9	12

new equipment by medical marketers					
2. Research evidence for efficacy	10	13	49	18	10
3. Technology-related issues					
3a) "Technophobia"	53	23	16	4	4
3b) Fear of adverse events	27	46	16	6	5
4. Availability of equipment	2	2	14	35	47
5. Operation issues					
5a) Time and ease of application	2	6	28	44	20
5b) Degree of self-confidence operating the device	3	2	7	52	36
5c) Busy and tight schedule at workplace		6	9	29	56
6. Preferences					
6a)Patient preference/request	41	16	26	11	6
6b) Instruction prescribed by referred physician	23	25	26	15	11

Factors which influenced the use of EPA's were background experiences, where entry-level studies and training and previous clinical experience, availability of equipment and busy and tight schedule were very strong factors influencing Physical-therapists. Whereas approximately half of the Physical-therapists didn't have any fear of technology and were self-confident enough while operating and delivering EPA as a treatment. But only 6% Physical-therapists felt that patient's preference was a very strong factor.

Discussion:-

The evolution of clinical decision making in the Physical-therapists is parallel to the growth and maturation of the profession [9]. Invention and increased availability of the Internet created means of implementing the 5 canonical Evidence- Based Practice steps which included:- ask, acquire, appraise, apply and assess[10,11,12]. Various factors influenced clinical decision making, and the data shows the equipment which is available mostly, such as IFT, US, SWD, IR and TENS are used most frequently, also the factor which influenced the most was background experiences.

Clinical reasoning is a complex and constantly evolving process. Contextual factors such as economy and politics are not easily changed, but factors such as the patient and the Physical-therapists as a person are more tangible[13].
Results suggest, many of the EPAs which were available to all, were mostly used daily, and those which were not available or scarcely available was due to lack of knowledge and awareness of that specific EPA to the Physical-therapists. Previous studies indicate that EPAs are poorly understood, despite of widespread use of EPAs, within Physical-therapists practice [14]. Hence, we can say that clinical decision making reflecting frequency of use of EPA is directly proportional to the availability and background knowledge of that equipment. Many previous researches have suggested that US, moist and cold packs and NMES were mostly available, and were used frequently[15,16,17,18].
As per our results, 58 Physical-therapists suggest that most influencing clinical factors are background experiences, for clinical decision making. Despite the widespread use of EPAs within Physical-therapy practice, previous studies indicate that EPAs are often poorly understood [14]. Shah and Farrow, suggested that EPAs which were seldom used, was due to lack of knowledge and training [18]. According to the present study it was found that new Physical-therapist graduates are lacking of confidence level in selecting and using EPAs on entering the workforce [19]. Previous studies suggest that once they enter into low-confidence stage, their comfort level with the EPA's may decrease; they would end up in fear of technologies, and end up in creating wrong protocols for the patient. However, the present survey results depicts, there were more Physical-therapists who were self-confident enough to take correct decision and treat the patient. The availability of equipment has been acknowledged as an important factor when using EPAs [5]. But just availability of equipment is not enough for the Physical-therapists to clinically design the protocol. There are many criteria one should look for after availing of EPA, that is evidences and efficacy of the EPA. Few evidences might suggest the null to adverse effects of EPA's, for example of SWD, where no definitive answers can be provided regarding the effects of SWD treatment on impairments (e.g., joint inflammation) or on functional ability[20]. Despite the availability of the EPA, Physical-therapists will opt for another EPA with greater therapeutic effects. The most influential factor here could be previous educational training.

Schedule at the work place is another influencing factor. Busy and tight schedule refers for the EPA's, if there is patient rush and all are to be given treatment of specific EPA, then the Physical-therapists will divert patient to other EPA, giving similar therapeutic effect to patients. According to our results, IFT, TENS, US and ES are the busiest modalities.

According to the present study, we in our Physical-therapy society, despite of treating wide variety of patients, we are not giving chance to patients, to select treatment of their choice. Previous studies have identified a low level of shared decision-making between patients and Physical-therapists [21,22], demonstrating the need to reinforce the patient's role in the decision-making process. According to evidence based practice the patient has an important role of shared decision making, and the unique and important skills it requires, training for shared decision making should be incorporated in the training of Physical-therapists [23].

Hence, various other factors which are pre-disposing to determine decision making by Physical-therapists which are-availability of equipments, exposure and knowledge of the equipment, efficiency and efficacy of equipment, researches and recent advances, patient or doctors preference[6,7]. However, availability of equipments and clinical knowledge are the main factors contributing to frequency of use of EPA [5]. If addressing private practitioners, they being biased for the specific EPA is mainly due to effectiveness, familiarity, ease of application, cost, and safety [8].
The survey was done in only one Physical-therapy set-up and Physical-therapy Interns and Master's students were practicing in the same clinic so the attitudes may be similar. According to their qualification the Physical-therapists were not highly experienced. In future the survey can be carried out in multiple Physical-therapists clinics, and among various age groups.

Conclusion:-

The survey depicts that EPAs are highly available and used for the treatment. The Clinical Decision Making factors which are background and experience, busy and tight schedule, and availability of equipment influenced the most as they were the strongest factors and degree of self- confidence while operating the device, time and ease of application, were also strong factors influencing their use for decision making, by Physical-therapists.

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