



DESIGNING AND DEVELOPING MULTIMEDIA PACKAGE FOR MOTHERS ON PREVENTION OF UNINTENTIONAL INJURIES AMONG CHILDREN OF UDAIPUR, RAJASTHAN.

Home Science

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ABSTRACT

The encumber of child unintentional injuries in India and the low level of knowledge of mothers warranty, specific directed efforts to avert the injuries in children particularly at home and on road. Research is the need of the hour to identify the magnitude and distribution of injury risks. Along with this there is a pressing need to develop suitable intervention and promote widespread adoption of these solutions for the credible advocates of child safety especially the mothers. The initiative through present research was intended to first identify knowledge of 180 mothers' regarding unintentional injuries, its causative factors and the safety features adopted for children of 4-6 years studying in three non government schools of Udaipur district, Rajasthan. Both these set of findings, experts opinion and literature review served as a basis for designing and developing a concise injury fortification multimedia package (DVD). For further reinforcing messages, an educational booklet i.e. a manual was developed. Script writing, audio recording, collection of images, preparation of a storyboard, synchronization of audio and text and finally evaluation of DVD by panel of experts were the steps followed to design and develop DVD and script writing, collection of images, arranging text with the matching images and evaluation by experts were the steps for manual preparation. Mean score was used to analyze data statistically. Results discovered that the mean score of overall evaluation of the visual aspect of DVD was rated as good with mean score 2.84 and all the nine visual criteria were good ranging between 2.60 to 3.0 out of maximum rating 3. Simultaneously, the mean scores of overall evaluation of the audio aspect was rated as good (2.89) and the ten criteria of audio aspect of DVD was rated good ranging between 2.77 to 3.0. The overall mean scores of the manual ranged between 2.69 to 2.87 (good) out of maximum score 3 and component wise also it was rated average and good by all the ten experts. Consequently, a well designed, developed, evaluated and field tested multimedia package will very well interweave into the existing knowledge of the mothers to be sentient of unintentional injury hazards.

KEYWORDS

Unintentional injuries, Multimedia Package, Designing and Developing, Mothers.

INTRODUCTION:

The burden of child injuries is not clearly known and scientific efforts in injury prevention and control are yet to begin in India (Uthkarsh, *et al.*, 2012, Zaidi, *et al.*, 2013 and Sahril, 2014). Consequently, strengthening mothers orientation is the most promising one to skirmish the injury problem. The literature about mothers' knowledge regarding unintentional injuries from different part of world like Qalubeya governorate (Electrocution 2012), Baghdad (Lafta, *et al.*, 2014), Tehran (Hatamabadi, *et al.*, 2014), China (Wang, *et al.*, 2012), Nepal (Shrestha, *et al.*, 2014); and Tripura (Debnath, *et al.*, 2014), Kanyakumari (Suguna, 2015), Chennai (Hema and Dilli Babu, 2015) etc from India expose to the fact that the mothers knowledge level still range around average category with a slight inclination towards poorer category. Research necessitate for improved mandatory injury education program to take a few key step forward by mothers in the conflict to trim down injury (Verma and Babel, 2017). Using customized messages and a generic package in compare to standard materials and packages, at an appropriate stage of child development in mother-directed intervention can boost optimistic effects to avert the tiny ones from the murkiness of injuries. An instructive programme delivered by via mass media through a teacher or a trained personnel or a health worker or community leader in classes, courses, and special sessions can be a powerful medium to empower mother, on the various aspect of domestic accidents specially the cause and safety promotion. These kind of package propose short-term and long term measures that parents, health care providers, communities and policy makers can take forward to keep the blooming lives secured from severe disability and death caused each day due to unintentional injuries like burns, scalds and electrocution, poisoning, falls, slips and trips, drowning and road traffic injury. Urgent attention is needed to reduce child injuries and address risk factors according to local context (Kataoka, *et al.*, 2015). Parallel to these studies Carlsson, *et al.*, (2011) were also of the view point that a teacher, health personnel or community leaders chosen to approach the education addressing parents is a good and proven strategy for child injury prevention.

The attention of educationists is changing towards the application of multimedia as a means of much desired swift communication of useful information with the main aim of defeating the language obstacles and illiteracy constraint as generally it is produced in local language with graphics, videos, images and animations so that all can easily access it. The Georgia Action Plan for Child Injury Prevention, (2015) has make known that to alleviate the risk of injury among mass, the application

of multi-media can be a good step forward to bring not only awareness but also to promote safer interventions as ample prospects subsist for modern technology and information systems to improve injury outcomes. Parallel to it is the study conducted by Van Beelen, *et al.*, (2014) who disclosed that the effectiveness of health promotion efforts has improved by the use of Web-based tools. Consequently, the initiative through present research was intended to first identify mothers' knowledge regarding unintentional injuries, the causative factors of the injuries and the safety features adopted for prevention of injuries among children of 4-6 years age group. Both these set of findings will serve as a basis for innovative and targeted injury-specific prevention programs to achieve greater injury control for young children. Also the investigation proposes to design and develop a concise injury fortification instructional multimedia package and for the further reinforcing of the messages an educational booklet i.e. a manual will be provided.

Objective:- To design and develop multimedia package for mothers on prevention of injuries among children of 4-6 years of age.

RESEARCH METHODOLOGY

Designing and developing MMP (Multi Media Package) for mothers on 'prevention of injuries' among children of 4-6 years of age.

A). Designing of Multimedia DVD

1). Gathering subject matter information:- In-depth review of published literature (i.e. peer-reviewed journal articles, books, and websites) and lengthy child injury prevention reports and guidelines of many international level organizations especially Center for Disease Control and Prevention (United States), World Health Organization (Switzerland), UNICEF (New York), Royal Society for Prevention of Accidents (United Kingdom), Safe Kids Worldwide (Washington, D.C.), Kids Safe: Child Accident Prevention Foundation (Australia), The Royal Children's Hospital (Melbourne) etc was made. TV, newspapers, magazines, conversations with the relatives and friends, recurrent visits to hospital pediatric ward during the research study proved to be the priceless source of information.

2). Finalization of subject matter and content outline: - Reviewing information from the individual and then delivering the tailored educational messages can bring out encouraging desired behavioral changes (Richards, *et al.*, 2007). So, the content outline of the package

was framed by keeping in mind the following:

- The analysis of data in phase-I of the study regarding the prevalent knowledge and practices of mothers regarding unintentional injuries.
- Review of literature.
- Experts' guidance.

Based on the gathered information a series of 1-5 comprehensive parts of DVD on the five most prevailing injuries materialize were Burns, Scalds and Electrocution, Poisoning, Falls, Slips & Trips, Drowning and Road Traffic Injuries among children of 4-6 years of age. The matter thus collected in English was translated in Hindi and was consecutively arranged to uphold continuity in the each part of DVD. So, the key content areas recognized as imperative and finalized to be included in the multimedia DVD were as following:

PART-1 BURNS, SCALDS AND ELECTROCUTION:

- Sources of Burns, Scalds and Electrocution.**
- Electric and Electrical equipment safety-** Causes of electrocution and its precautionary measures, The role of electrician during faults, Warnings for domestic and high voltage.
- Cooking safety-** Hazards in the kitchen, Guidelines for safe cooking, Fire safety in kitchen.
- Handling hot items (solid and liquid)-** Causes of accidents, Safety steps to prevent injury.
- Safety related to medical oxygen cylinder, candles, cigarettes, gas cylinder.**
- Firework safety-** Causes of injury, Safety measures for injury prevention.
- Sun safety-** Causes of sun burn, Guidelines for sun safety.
- Concept of inflammable clothing for children.**
- General information regarding different fire-extinguishers and its handling.**
- Home fire escape plan.**
- Safety during fire at home.**
- Skill to be developed in children for fire safety.**
- Emergency contact numbers.**
- First aid for burns/scalds.**

PART-2 POISONING:

- Concept of poisoning.**
- Sources of poison at home.**
- Reasons for child sensitivity towards poison.**
- Medicine safety-** Causes of accident, Safety measures, Management of surplus and expired medicines.
- Cleaning product/Insecticide/Chemical safety.**
- Homemade cleaning products.**
- Art supply safety.**
- Safety aligned with lead poisoning.**
- Sources and Precautions for carbon mono oxide poisoning.**
- Unknown plants safety-** Detailed description of common household poisonous plants, General information of common and safe plants.
- Pet safe practices.**
- First aid for poisoning.**

PART-3 FALLS, SLIPS AND TRIPS:

- Sources of falls, slips & trips.**
- Stair safety.**
- Window/balcony/unguarded height safety.**
- Furniture/huge equipment safety.**
- Floor safety-** Footwear, Bathroom, Rugs and carpets.
- Basic playground safety rules for-** Swings, Slides, Climbing apparatus, Seesaws.
- Safety tips for small wheeled devices like roller skates, skate board, rip stick etc.**

PART-4 DROWNING:

- Sources of drowning.**
- Indoor (home) and outdoors-** Contributory factors of drowning, Safety measures to prevent drowning.
- Pool safety-** Contributory factors of drowning, Swim safety, Pool safety management.
- Steps for drowning prevention.**

PART-5 ROAD TRAFFIC INJURIES:

- Reasons of road traffic injuries among children.**
- Bicycle safety-** Cause of injury, Precautions to be followed for prevention of bicycle injury.

- Car safety-** Causes of accidents, Guidelines for car safety.
- Parked car safety-** Contributory factors for injury, Safe measures.
- Heat facts: General information.**
- Two wheeler safety-** Causes of accidents, Guidelines for two wheeler safety.
- Pedestrian safety-** Causes of injury, Guidelines for pedestrian safety.
- Safe cross code: General information.**
- School bus safety-** Causes of injury among children, Teaching child safe bus ride, Parents' responsibility toward school bus safety.
- Helmet fit test.**
- Hand signals during cycling: General information.**

3). Preparation of DVD:

The effective and artistic handling of the subject matter guarantees the unbeaten communication. So, DVD was made by using three software i.e. Adobe Premier C. S., Adobe Photoshop and Sony Sound Forge software all of which allows the dynamic control of images, text and sound. Also, it allows the control of sound with the text messages for artistic use, entertainment and information purpose. The DVD was developed under following head-

- **Writing Script:** An audio-visual script, pre-visualizing description of images, effects and commentary was prepared in Hindi.
- **Audio recording:** Audio for entire DVD presentation was recorded in a sound proof room. After recording, the entire editing work of audio for DVD was done using the Sony Sound Forge software. Editing of sound included the merging of multiple takes, erasing the unrequired footage and adjusting the volume. After edition, exported audio as Mp3 format having 128Kbps size and then final output was achieved.
- **Collection of images:** According to the written script, the live images regarding all the components of various injuries were imported in JPEG format. The size of the images was large so that during exposure through LCD the large images could be clearly visualized without blurring. Wherever the large size live images were not possible, clip arts were captured and inserted to provide a feeling of continuity in the images.
- **Preparation of a storyboard:** It is basically a visual interpretation of the script; it allows getting a feel for what is going to be presented on the screen. So, a rough story board was designed according to the content in order to decide the sequence of images and text. After this a final story board was prepared covering description of special effects such as fading, typewriter, mixing, wiping in different styles, dissolving, zooming, sliding etc with text, images and sound. The duration according to each part/component of DVD is given below:

Components	Duration (min.)
Introduction	5:00
Part-1 Burns, Scalds and Electrocution	27:55
Part-2 Poisoning	29:15
Part-3 Falls, slips and trips	14:59
Part-4 Drowning	9:18
Part-5 Road Traffic Injury	19:57
Conclusion	00:31
Total	105:35(min.)

- **Synchronization of audio and text:** A time line was created in Adobe Premiere software. Then all the images were imported which were rescaled to 1280×720 size in Adobe Photoshop. After this, the audio was imported. All the images were synchronized with audio and then the required was typed on images with special presentation effects like typing, rolling, wiping etc. After this, the predefined transition effects for the text such as fading, mixing, wiping in different styles, dissolving, zooming, sliding etc were inserted in the time line. Time line is a track in which there is a space for audio and playback video with layer options having speed of 25 frames/sec. Then light background music was imported and inserted in audio time line to give a slight entertaining effect breaking up the monotony.

To get the final output the time line was exported in HD (High Definition) size as Mp4 format (Mp4 video properties are RGB colour and frame is 25 frame/sec).

After this the final Mp4 video was imported in AVS video editor to burn DVDs.

4). Evaluation of multimedia DVD by panel of experts:

To test the appropriateness of the aid, the developed package was subjected to evaluation by panel of experts. The panel comprised of a team of 10 members. The panel comprised of one health professional and also a mother of 4 and 6 year children (Health care providers should be involved in the intervention design process and selection of the action plan (CDC, 2012)), two Subject Matter Specialists (SMS) of Home Science Extension and Communication Management, two Subject Matter Specialists of Human Development and Family Studies, two Home Scientists who were the mother of children of this age group, two mothers working as a teacher in school and the last one was a computer professional. Each member evaluated the aid through an evaluation sheet which consisted of two sections. First section included the visual assessment of the DVD in terms of nine (09) criteria i.e. purpose accomplished, content, organization and layout, colour, visual clarity, attention catching, self explanatory features, continuity in messages, tuning of visuals with commentary. Second section was regarding the audio assessment part in terms of ten (10) criteria i.e. language, commentary, content clarity, voice, continuity of messages, pace and speed of narration, length and time of narration, overall length of program, music and interest orientation.

All the experts were contacted personally to critically evaluate the developed DVD on injury prevention. All the criteria were evaluated on a 3 point continuum of good, average and poor with scores of 3, 2 and 1 respectively. In all, there were 19 criteria (9 for visual and 10 for audio) with a maximum score 57. DVD was shown to the experts explaining the program evaluation sheet with criteria and continuum. Then the evaluation sheets were distributed to the panel members before the exposure to DVD so that they could view and evaluate program simultaneously. The filled evaluation sheets were collected and mean scores were calculated. Results so obtained were categorized as good, average and poor with mean score 2.5-3.0, 1.5-2.5 and 1.0-1.5, respectively. On the basis of experts comments slight modifications were made in condensing the text of few topics and editing and addition of few images.

B). Designing of a Manual:

Script writing: The Manual had eight chapters stated as under:

- Why make your home Kid-safe?
- Steps to prevent unintentional injuries.
- Burns, Scalds and Electrocution-Causative factors and Preventive measures.
- Poisoning-Causative factors and Preventive measures.
- Falls, slips and trips-Causative factors and Preventive measures.
- Drowning-Causative factors and Preventive measures.
- Road Traffic Injuries-Causative factors and Preventive measures.
- Home safety checklist.

The first chapter illustrated the importance of a child and describes how an uncongenial environment at home and surroundings can harm the life of a child. The second chapter describes the simple steps to be followed for keeping the child safe. The content used in part 1-5 of DVD was used as such in the manual chapters from c-g but the images used were different to give it a variation from DVD. The last chapter Home safety-checklist was regarding the simple instructions to be checked in home to make it secure.

- Collection of images:** According to the written script, for most of the written text the live images and the clip arts were imported relevant to all the components of various injuries in JPEG format.
- Arranging text with the matching images:** The collected images and clip art were dragged on the work space in Corel Draw software against the text and the size of these were adjusted according to the work space. Outline designing was done to get an attractive look on the cover page as well as all the 51 pages of the manual to give it a booklet form.
- Evaluation of the Manual by experts:** Before giving for final printing, the manual was given for field testing to few mothers, persons from Extension and Communication Management and Media development field for necessary suggestions and required modifications. After making all the corrections, the final copy was subjected for evaluation by the experts. The same panel of 10 judges (selected for evaluation of the DVD) was taken for evaluation of the manual. For this evaluation sheet was prepared in which all the eight topics/components of the manual were evaluated on six criteria i.e. clarity of visuals, subject matter, organization and continuity, colour combination, appropriateness of size and overall presentation. The developed manual was

evaluated using three point continuum of good, average and poor with scores 3, 2 and 1 and the results so obtained were categorized as good, average and poor with mean score 2.5-3.0, 1.5-2.5 and 1.0-1.5, respectively.

Once developed, the instructional MMP was pilot tested with 20 non sample mothers to determine package revisions and check.

RESULTS AND DISCUSSION

A. Evaluation of Multimedia DVD

The multimedia DVD on "Injury Prevention" along with the parts/components was subjected to evaluation by panel of experts on a three point continuum. The DVD was evaluated for two aspects i.e. visual aspect and audio aspect.

Evaluation of visual aspect of multimedia DVD: Mean score of overall evaluation of the visual aspect of multimedia DVD shown in Table 1 which indicate that DVD was rated as good by experts with mean score 2.84. Simultaneously, in all the criteria i.e. purpose accomplished, content, organization and layout, colour, visual clarity, attention catching, self explanatory features, continuity in messages and tuning of visuals with commentary the DVD was rated good as the scores in all these criteria ranged between 2.60 to 3.0 out of maximum rating 3.

Table 1 : Overall Evaluation of the visual aspect of Multimedia DVD by Experts

S.No.	Criteria	Mean score
1	Purpose accomplished	2.60
2	Content	2.78
3	Organization and layout	2.82
4	Colour	3.0
5	Visual clarity	2.97
6	Attention catching	2.88
7	Self explanatory features	2.88
8	Continuity in messages	2.80
9	Tuning of visuals with commentary	2.85
	Overall evaluation	2.84

Evaluation of audio aspect of multimedia DVD:

Table 2 indicate that the mean scores of overall evaluation of the audio aspect of DVD which was rated as good by the experts with mean score 2.89. Further, in all the ten criteria of audio aspect i.e. language, commentary, content clarity, voice, continuity of messages, pace and speed of narration, length and time of narration, overall length of programme, music and interest orientation the DVD was rated good by experts with the mean score ranging between 2.77 to 3.0.

Table 2: Overall Evaluation of the audio aspect of DVD by Experts

S. No.	Criteria	Mean score
1	Language	2.88
2	Commentary	3
3	Content Clarity	3
4	Voice	3
5	Continuity of messages	2.91
6	Pace and speed of narration	2.77
7	Length and time of narration,	2.77
8	Overall length of programme	2.77
9	Music	2.97
10	Interest orientation	2.86
	Overall evaluation	2.89

Component/part wise evaluation of the audio and visual aspect of multimedia DVD by the experts in Table 3 reveals that all the components were evaluated good and the mean scores in different criteria of audio and visual aspects ranged between 2.4 to 3 i.e. good and average. The component 'Road Traffic injuries' was rated good by the experts with the highest mean score of 2.92 followed by 'Drowning' and 'Introduction' with mean score of 2.91. Similarly, the component 'Poisoning' was recorded to be third with the mean score of 2.84. And the remaining three components i.e. 'Burns, Scalds and Electrocution', 'Falls, Slips and Trips' and 'Conclusion' were having the similar mean score of 2.83 respectively.

Table 3: Component/part wise Evaluation of the audio and visual aspect of Multimedia DVD by the Experts

Criteria	Visual Aspect (Mean Scores)									Audio Aspect (Mean Scores)									Overall Evaluation
	Purpose accomplished	Content	Organization & Layout	Colour	Visual Clarity	Attention Catching	Self Explanatory	Continuity of Messages	Timing of visuals with commentary	Language	Commentary	Content Clarity	Voice	Continuity of Messages	Pace & Speed of the Narration	Length & Time of Narration	Overall length of programme	Music	
Introduction	2.6	2.8	2.6	3	3	3	3	2.8	3	3	3	3	3	3	2.8	3	3	2.8	2.91
Burns, Scalds and Electrocutation	2.8	3	3	3	3	2.6	2.6	2.8	3	2.8	3	3	3	2.8	2.6	2.6	2.4	3	2.8
Poisoning	2.8	3	3	3	3	3	2.8	2.6	2.8	2.8	3	3	3	2.8	2.6	2.6	2.4	3	2.8
Falls, Slips and Trips	2.4	2.6	2.8	3	3	2.6	2.8	2.8	2.8	2.8	3	3	3	2.8	2.8	2.8	3	3	2.83
Drowning	2.6	2.6	2.8	3	3	3	3	3	3	2.8	3	3	3	2.8	2.8	3	3	3	2.91
Road Traffic injuries	2.6	2.8	2.8	3	3	3	3	2.8	2.8	3	3	3	3	3	3	3	3	3	2.92
Conclusion	2.4	2.6	2.8	3	2.8	3	3	2.8	2.6	3	3	3	3	2.8	2.8	2.8	2.8	2.6	2.83

B. Evaluation of Manual

The manual was subjected to same panel of ten experts taken for evaluation of multimedia DVD. The manual was evaluated on a three point continuum i.e. good, average and poor for clarity of visuals, subject matter, organization and continuity, colour combination, appropriateness of size and overall presentation. A detailed description is given in Fig 1.

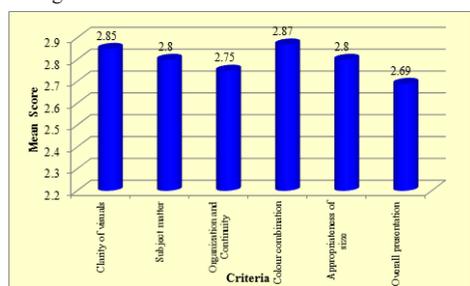


Fig. 1: Overall Evaluation of Manual by Experts

Table 4: Component wise Evaluation of different aspects of Manual by Experts

S. No.	Component	Clarity of visuals	Subject matter	Organization and Continuity	Colour combination	Appropriateness of size	Overall presentation
1	Why make your home Kid-safe?	2.6	2.2	2.4	2.6	2.4	2.2
2	Steps to prevent injuries	2.2	2.4	2.6	2.4	2.4	2.4
3	Burns, Scalds and Electrocutation	3	3	3	3	3	2.8
4	Poisoning	3	3	3	3	3	2.9
5	Falls, Slips and Trips	3	2.8	2.6	3	2.8	2.6
6	Drowning	3	3	2.8	3	2.8	2.8
7	Road Traffic Injuries	3	3	2.8	3	3	2.8
8	Home safety checklist	3	3	2.8	3	3	3

Once developed, the MMP was pilot tested with 20 non sample mothers to determine package revisions and check. The mothers were able to understand the package and no major comments and remarks were made to improve or change.

SUMMARY AND CONCLUSION: The well designed, developed, evaluated and field tested multimedia package will very well interweave into the existing knowledge of the mothers to be sentient of unintentional injury hazards and will forever help to stand by to safe guard their children which can put in their child to either death or hospitalization or a visit to an emergency care unit or can result in a temporary or permanent disabilities whether physical or social or either psychological. Even the amputations, deformity, pain, suffering and agony could be prevented.

REPORT:

- Centers for Disease Control and Prevention. (2012). National action plan for child injury prevention. Washington, DC.
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Perusal of Fig.1 disclose that the mean scores of the manual ranged between 2.69 to 2.87 out of maximum score 3, which indicate that manual was judged good for all the criteria.

Component wise evaluation of different aspects of manual shown in the Table 4 below indicate that all the aspects of different components of manual were rated average and good by experts in terms of clarity of visuals, subject matter, organization and continuity, colour combination, appropriateness of size and overall presentation. The mean scores ranged between 2.2 to 3 in all the eight components. Among all the components, Poisoning was rated with the highest score of 2.98 of 3 followed by this were two components i.e. Burns, Scalds and Electrocutation; Home safety checklist with second highest score of 2.97. Road Traffic injuries were rated third with the mean score of 2.93. Drowning and Falls, Slips and Trips was rated as fourth and fifth with the score of 2.90 and 2.80 respectively and lastly two components Why make your home Kid-safe and Steps to prevent injuries was rated with an average score of 2.40 each.

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