1949

A survey of thirty five Massachusetts high school gymnasiums for hazards in basketball under playing conditions

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Thesis

A SURVEY OF THIRTY FIVE MASSACHUSETTS HIGH SCHOOL GYMNASIUMS FOR HAZARDS IN BASKETBALL UNDER PLAYING CONDITIONS

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CHAPTER I

INTRODUCTION

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INTRODUCTION

Area in which Problem is Located

This is a survey on thirty-five High School Gymnasiums in Massachusetts, implying safety in the field of Physical Education, concerning hazardous obstructions and constructions in a gymnasium, under actual playing conditions, in a basketball contest. The writer is emphasizing the relationship between Physical Education and Safety. For example, Irwin[1] comments, "teachers in physical education should teach safety having to do with participation in physical education."

Why it is a Problem

Because of the numerous types of gymnasiums which are conducive to all kinds of hazards, there is a definite problem and need for correction.

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[1] Leslie W. Irwin, "Safety Program in Schools", The Curriculum in Health and Physical Education. (1944) p. 290 - publisher Mosby.

<u>Need for Study and Relationship of Solving Problem</u>

The author feels the following needs are most apparent for this study: -

1. Most gymnasiums are too hazardous.
2. A need for showing improvements to Educators.
3. Need for work on program for better and safer gymnasiums.

Stack and Siebrecht[1] show their interpretation for the need of safety in athletics, in their statement: "Two factors point to the increasing need for greater safety precautions in the field; the increasing number of participants in these activities; and the accident situation in institutional recreation and athletics."

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1 Herbert J. Stack and Elmer B. Siebrecht, "Recreation and Athletics", <u>Education for Safe Living</u> (1945) p. 92 Publisher Prentice-Hall.

CHAPTER II

STATEMENT OF THE PROBLEM

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STATEMENT OF THE PROBLEM

Study of High School Athletic Contests from the point of view of safety - approached by observing interscholastic contests to observe hazards and unsafe routine practices, and viewing 35 interscholastic games in different gymnasiums under actual playing conditions in basketball.

<u>Purpose of the Study</u>:

This study was undertaken to obtain the hazards in the 35 gymnasiums visited, under actual playing conditions, in a basketball contest - and to determine the most frequent weaknesses and their need for correction.

CHAPTER III

RELATED RESEARCH

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RELATED RESEARCH

Very limited study has been undertaken previously on this subject. The actual determination of the list of hazards to be presented has been of utmost importance. The National Safety Council[1] reports the following: -

> "Of the school building accidents, 25 percent were in gymnasiums, dressing rooms, swimming pools, or shower rooms. In high schools, accidents in gym or associated areas accounted for 33 percent of all school premises accidents, with 28 percent of them occurring in the gymnasium alone."

Before this study could be accomplished the author had to set up a check list for these hazards (Appendix), page 34. By confering with basketball coaches,[2] reading books and journals[3] and corresponding with Don Cash Seaton[4] and Howard G. Danford[5], the writer was able to compile what is as complete a list as possible under the circumstances.

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1 Accident Facts-1948 Edition (National Safety Council Report) Publisher - National Safety Council, Inc.

2 Richard Cochrane-Ex-Tufts College Basketball Coach-now Principal High School, Sherborne, Mass.
Meldon Wenner - Coach of Basketball, Belmont High School

3 Lloyd- Dec. 1946, School Board Journal- publisher Lloyd
Physical Education Facilities - Blair -Publisher A.S. Barnes &Co.
Athletic Injuries - Eastwood - Stevens -Publisher W.B. Saunders Co.

4 Don Cash Seaton - Research Associate N.Y.U. center for Safety Education

5 Howard G. Danford, director, Dept. of Health, Physical Ed., Recreation, and Safety-Madison Public Schools - Wisconson.

Because of the fact that all gymnasiums are constructed differently, usually to coincide with the financial status of the community involved, it was rather difficult to determine an ideal situation. For this reason the author believes this type of survey has not been considered prior to this.

Certain minimum standards have been reached for Junior High School, High Schools and College gymnasiums; but, for the most part, no definite study of actual conditions involved has been undertaken.

CHAPTER IV

PLAN OF SURVEY

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PLAN OF SURVEY

Check List

The writer by correspondence and conversations with several leading basketball and physical education men[1], collected a list of twenty-eight items that, when compiled, represents the hazards checked upon visits to the various gymnasiums. The author also used various books and journals.[2]

Use of Check List

When attending the games at the gymnasiums, this check list was deligently used by the writer. Following each contest, if possible, a talk with the home coach was arranged, and the author went over all items to receive any suggestions or impressions that could be given.

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[1] Don Cash Seaton-Research Associate N.Y.U. center for Safety Education.
Howard G. Danford, director, Dept. of Health, Physical Education, Recreation, and Safety-Madison Public Schools, Wisconson.
Meldon Wenner-Coach of Basketball, Belmont High School
Richard Cochrane-Ex-Tufts College Basketball Coach-now Principal High School, Sherborne, Mass.

[2] Lloyd-Dec. 1946, School Board Journal, publisher, Lloyd
Physical Education Facilities-Blair-Publisher, A.S. Barnes &Co.
Athletic Injuries-Eastwood-Stevens-Publisher, W.B. Saunders Co.
Educational Digest-Dec. 1948 - "Reduce Accidents at School". Publisher-L.W. Prakken.

Justification of Check List

Because of the various conferences and discussions the writer held with several other men in this field, it is believed that for the purpose of this study, the method as used does suffice.

"To the surveyor the questionnaire is fundamentally a method of collecting data."[1] This is more especially so when the surveyor appears in person to be sure that all items are checked personally.

It is generally believed that this form of research is recognized as useful in education. Stokes and Lehman[2] show their interpretation in their statements: "This method is apparently still indispensable to medicine, the social sciences, education, religion, government, etc. At the present time it seems unlikely that the questionnaire method will never be wholly discarded."

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1 Elwood Craig Davis, "Methods and Techniques Used in Surveying Health and Physical Education in City Schools", Contributions to Education, No. 515, Bureau of Publications, Teachers College, Columbia University, New York, 1932, p. 51-2. Publishers - Prentice-Hall.

2 Stuart M. Stokes and Harvey C. Lehman, "The Influence of Self-Interest upon Questionnaire Replies", School and Society (September 1930) 32: 435. Publishers - Society for Advancement of Education, N.Y., N.Y.

Most writers in educational research recognize the usefulness of the check list or questionnaire in education. H. R. Douglas[1] from the School of Education, University of Oregon, says, "I believe in the questionnaire as one extremely valuable method of inductive research into educational practice."

Limitation of Method Used

No real check list to the author's knowledge has ever been completely compiled along the lines of this paper's title. Therefore, it may be entirely possible that a more complete list could be made up with an exhaustive study along these lines.

While the writer personally checked the entire list by attendance at the games, plus discussions with the home Coach, it is felt that as reliable a report possible, for all the hazards mentioned has been made.

As 35 different gymnasiums were covered during this study, it represents a good cross section. The division between, what is commonly known as "A", "B", and "C"division teams in this section is as follows: - "A" - 11, "B" - 12, and "C" - 12.

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1 H. R. Douglas, "The Questionnaire--To Be or Not To Be", School and Society (April 1922) 15: 399. Publishers- Society of Advancement of Education, N.Y.,N.Y.

Reliability of Method

The reliability of this method would seem to rest in the ability of the writer to properly interpret what he actually notes during the progress of the activity visited.

He believes the added information collected from the home Coach following each encounter adds to the reliability of the conclusions reached.

The author believes that the actual visit for his information, as well as personal contact with the Coach, presents a much better opportunity for more accurate observation and information.

Treatment of Data

By using a fairly even distribution of size schools "A", "B" and "C", as used by the Eastern Massachusetts Interscholastic Tournament, it seems to gain in validity due to the ability of the various communities to afford the best in gymnasiums.

Group "A" consists of all teams considered in leagues warranting this classification for Invitation Tournaments; and not necessarily by ability to pay or population. Group "B" and "C" are considered under the same system as the aforementioned group "A".

The author used this breakdown throughout the study when warranted, but in general, the entire 35 schools were considered on the same level, as it seemed more practical this way.

To complete this survey, it seemed that the method used was the most reliable to gain the necessary information desired and compile the most accurate results.

CHAPTER V

ANALYSIS OF DATA

CHAPTER V

ANALYSIS OF DATA

The data was analyzed for the following:

A. To determine the most frequent individual combination of hazards in the high school gymnasiums.

B. To determine clearly all hazards in order of frequency and need for improvement.

C. To determine what individual schools need.

D. To determine what is lacking as a group.

E. To determine, if possible, an ideal set up.

F. To determine the best check list for gymnasium hazards.

The analysis chart (pages 26 and 27) shows the entire list of hazards checked with the frequency of occurance, both passable and not passable. This is contained in frequency numbers. The 28 items listed represent the authors ideas of the hazards confronted in basketball games under normal playing conditions. This list found in the analysis chart has been set up to cover all possible hazards during actual playing of contests. It was sifted and corrected many times by the writer and forms the basis of the entire study.

In the first column the list of all items checked is included in just the form viewed by the writer, while in attendance. Column 2 shows the frequency of passable or better, of each individual item of the 35 schools when visited. The totals in this column are the satisfactory attainment obtained by actual viewing the situations listed. Column 3 is a list of definite failings in accordance with the item in question. The frequency of occurance of column 3 naturally tends to vary considerably in communities where the ability to pay or custom of the past enters in. It is probably almost impossible, except in rare instances, whereby a city or town could answer in the affirmative to all items listed.

The analysis of the entire table as a whole has been broken into groups "A", "B", and "C". The explanation of the groups was determined in Chapter IV. A comparison of the groups will be made as the survey goes along.

The purpose of the analysis chart is to give an overall picture of the hazards with the frequencies in which they occur in the total visits. The question of analysis will be taken up in individual treatments of each hazard noted. The conclusions drawn and recommendations made have been taken from the single items as the discussion proceeds.

Item 1 shows a definite need for proper provision of storage recesses for pianos and phonographs. In the 35 conditions visited, 25 either have proper provisions or are not confronted with this problem. The remaining 10 are hindered by the situation. In some cases, the piano is actually immediately adjacent to the side lines, with little or no protective padding. The smaller schools (5 in number) seem to run into this more frequently than the others, usually because of size and combinations of gymnasium and auditorium. Some make an effort to cover or block off the obstruction with varying degrees of success.

In the medium and larger schools separate parts are set aside for other activities and the gymnasium does not contain the necessity of housing a piano or phonograph.

The second item is concerned with doors to storage spaces flush with the walls. This presents a problem in 12 gymnasiums, while the remaining 23 either do not have this to contend with directly, or is satisfactorily taken care of by other means. The hazard of injury here is apparent, with the frequency that this occurs in this study. Once again it seems to fall on the smaller schools group (7 in all) to the greater extent, as they have the lesser room to take care of the situations.

The matter of lights recessed in the ceiling and proper lighting - item 3 presents quite a perplexing problem, as 23 out of the 35 do not comply favorably here. In some instances where lights are recessed the power of the lights are not adequate. For the most part it is a matter of the latter, which is most detrimental. This situation occurs in frequency about even in all groups - "A" - 7, "B" - 8, and "C" - 8. It seems to be a fault in architectural construction in the initial planning. The breakdown by schools is so one sided against the proper lighting facilities, it is apparent that for the most part this is a bad feature in our gymnasium set ups. Accidents and injuries, plus loss of scores have come about because of this hazard.

Item 4 points out the amazing fact that 11 schools still do not have safety glass in their doors, when it is essential and apparent to all, and the safest and surest type to use. 24 schools either have the safety glass or are not concerned with it. In this breakdown, group "A" has 5, group "B" - 2 and group "C" - 4. The schools not giving the proper protection to its' players.

In item 5, all but two gymnasiums fulfills the hazard of doors open away from playing space, to avoid the possibility of players colliding with them. 1 school in group "A" and 1 in group "B". According to this data, the situation described above is well mastered.

In the matter of item 6, drinking fountains, radiators, mat hangers, and door knobs recessed and properly padded, it was found that 27 schools either successfully took care of this or were not bothered with it. The remaining 8 had a definite situation. These to be broken into groups found 2 in "A", 4 in "B" and 2 in "C". This shows a fairly even split between the groups and points to no major violators.

The hazard of wall covers rounded or padded, if possible, item 7 - finds 9 violators in the group of 35. Most gymnasiums are not confronted with the need for protection; some take care of it, but 9 not sufficiently to be called extremely safe under actual playing conditions. Again injuries of a very serious nature can and do result from these conditions. In the group make up we find group "A" with 3 violators and group "B" and "C" with 2 and 4 respectively.

Item 8, goals near end wall or bleachers padded, find in group "A" - 2, group "B" - 0 and group "C" - 4. Which shows a surprising condition of group "B" not having this item to contend with. Most gymnasiums (29) are not confronted with this problem or have it sufficiently under control, not to be considered harmful. In group "C" again we find a predominance of the defect (4 to 2) which is a result of smallness of the construction, probably because of the shortness of necessary funds.

In the concern of windows screened to protect players and windows, item 9, we find all but 1 school conforming to this item. This gymnasium is in a "C" group school and is a type that has a combination gymnasium and auditorium, which is unfit in many ways to the successful carrying out of basketball games. The other 34 places in their construction have allowed for this point and have successfully eluded the problem.

In item 10, shades provided for windows where the sun's glare is likely to blind players, we find that 27 against 8 have them. This problem confronts many teams that participate in afternoon games, and creates the necessity of adjustment to the eyes, plus the chance of injury at all times. The 8 defective plants are divided as follows: group "A" - 4, group "B" - 4 and group "C" - 0. The failings of group "A" and "B" are quite obvious here, as group "C" has taken care of this problem successfully.

As for gymnasiums so constructed as to remove hazards, pillars, or obstructions projecting over the playing surface, as stated in item 11. We find 9 violators to this item. However, the breakdown is different, to the extent that group "A" has 1, group "B" - 3 and group "C" - 5. The line up here changes to show groups "B" and "C" the chief perpetrators, while group "A" has but 1 failure. All the other schools have done an excellent job in conquering this type of hazard.

One of the chief faults of construction of gymnasiums, from a spectators point of view, item 12, lies in the item, sufficient area for the peak loads to prevent overcrowding and pushing. Out of the 35 plants visited, 21 have definitely, this bad defect in its' way. Undoubtedly this is most serious because it can cause all kind of thinkable accidents from stands collapsing, to riots. 14 of the gymnasiums visited have sufficient space which is far below the average of hazards throughout the entire study. The breakdown as to groups is: group "A" - 7, "B" - 7 and "C" - 7. This frequency would indicate that all groups are finding this trouble about evenly distributed amongst them.

As to the gymnasium overloaded with spectators, item 13, the writer found 19 this way, while actually visiting them. Because basketball has taken quite a spurt ahead in popularity in this section, it is quite understandable how this has taken place. Most gymnasiums are quite old and out of date in the area, and with this new enthusiasm, the results are apparent. The grouping of the defect is "A" - 8, "B" - 5 and "C" - 6. Two of the gymnasiums limit the sale of tickets to try to offset this condition. The "A" group shows a slight lead in this phase, with "B" and "C" following close behind.

Item 14, clearance of areas adjacent to the side and end lines of the basketball courts, show 21 with this situation passable or better and 14 not taken care of to the satisfaction of the writer. Many injuries and crowding conditions result from this type of hazard. The actual breakdown of the three groups in respect to violation of this condition are as follows: group "A" - 6, "B" - 3, "C" - 5 and 3 with just fair conditions existing, which might be considered passable under the present circumstances.

The concern of floor surface in regard to slipperiness and uneveness (item 15) shows of schools lacking in this quality. 28 schools do not run into this type of trouble because foresight in construction or constant work on it has prevented its' occurance. This type of hazard can result in bad sprains, broken bones and the like. The lineup in groups of this particular item is: group "A" - 3, "B" - 2 and "C" - 2. About an even distribution of groups is shown here.

The matter of knee pads and elbow pads for protection (item 16) shows 24 schools not using or providing for them. The author believes that this is so, because the players do not show any desire to wear either knee or elbow pads. This precaution could cut down on floor burns and other injuries considerably, but most coaches have no desire to use them. The author's own team has them; and finds very few boys asking for their use. In the group breakup, we find: group "A" with 9, "B" - 7, and "C" - 8. The distribution of faults here is about even.

Item 17, sneakers or other faulty equipment that will cause hazards to the players. This seems to be another failing of coaches. Because the school does not supply sneakers, they do not take the time to inspect all equipment worn prior to participation. Upon looking further into the matter, we find group "A" with 7, "B", 7 and "C", 7; thus showing even distribution.

Size of gymnasium in regard to regulation, item 18, (using 70'-80' length and 40'-50' width as measurements) is ~~this~~ naturally, in most cases is at fault, is a strong indication of the amount of money the community wished to spend in the construction of its' athletic facilities. There are in actual numbers, 21 with passable or better in this respect, and 14 that are either too large or too small. The writer believes that in viewing these contests, the larger gymnasiums are just as hazardous in many ways as the smaller ones. The faulty plants breakdown into "A" - 3, "B" - 5 and "C" - 6, of which 12 are too small and 2 too large. It seems the "B" and "C" classes, or mostly smaller communities, have the non regulation courts.

Equipment too close to the playing surface (item 19) presents another in this series of hazards of which 14 are guilty. The remaining 21 do not have the troubles that this presents. The grouping for this can be summed up as follows: group "A" - 6, "B" - 3 and "C" - 5. The "A" and "C" groups have most of the troubles here which contributes to some injuries that occur during the basketball season.

Stands on edge of outside lines under the basket and end wall, placed far enough back to give players protection (item 20), is found to be in the affirmative at 20 courts. However, 15 others have this very prominent problem confronting them. This feature tends to roughen up a game, as the author noted, and to increase the chance of injury considerably. The breakdown into groups shows the split as follows: "A" - 5, "B" - 5 and "C" - 5. Several of the passable ones just about made the grade. This phase of hazardous conditions has always bothered the writer, so he notices it with much gusto upon occasion. The group split shows the weakness evenly distributed amongst them.

Item 21, stands safe for spectators, is most important, because every now and then a fatal mishap takes place in a gymnasium and the critics fall on basketball immediately. We note that out of the 35 visits, all in the opinion of the writer would pass the test. A good many of the buildings do not have stands; many have auditorium seats, straight chairs, or built in seats, for other uses besides that of basketball. But, on the whole, the entire 35 would be judged safe for the normal seating capacities.

Going on to item 22, the matter of windows arranged for proper ventilation, the author found that 9 buildings do not comply satisfactorily to this condition. The other 26 are all positioned or projected so as to give a normal amount of ventilation. The group numbers for these are: "A" - 3, "B" - 2 and "C" - 4. The distribution according to the items shows a fairly even ratio. This item can cause ill feeling among players, both physically and mentally. It is bad for the health of the spectators as well, and sometimes makes it most difficult for the officials to properly handle the game in question.

Proper officiating to handle game (item 23). In each game the writer viewed the officiating was at least passable. No serious outbreaks or other disturbances resulting from inefficient handling of the games took place. In talking with the coaches following the game, no one seemed to have any outstanding complaint.

Item 24, adequate police protection, in all cases but one was in accordance with the communities regulations. In some instances it was possible that another policeman could have been engaged, but the points of the law were covered, and all seemed to be under control. The one gymnasium without protection was a private school that has a system of faculty supervision, which seemed to work out well. The writer was informed that - "they never had had any trouble". The building did seem very well supervised.

For the matter of fire laws in effect (item 25), all schools say they do obey them, however, the author is inclined to believe that some gymnasiums are overloaded. In the writers opinion there are 21 schools (note item 13) that at one time or another are violators. Naturally, it is just certain key games that bring these conditions, possibly once or twice a year, but it does happen. However, the writer does believe the schools do attempt to obey these laws for the most part.

Item 26, obstructions, hanging ropes, bars, beams, pipes, low ceilings, ladders etc. It was found that 27 out of 35 did not run into any of this kind of trouble. If these obstructions were present they were accounted for by expert concealment. The remaining 8 schools did have one or more of the list in evidence, which could in many ways cause injuries or complications. According to groups, the following is the combination, "A" - 3, "B" - 1 and "C" - 4. The "A" and "C" group show predominance in this type of hazard.

The safe place for timer's and scorer's table in a gymnasium, caused the writer considerable concern (item 27), they were placed so as to be hazardous to the players, and in some cases where the spectators could cause considerable trouble. The analysis of this by groups is as follows: "A" - 6, "B" - 2 and "C" - 1. The larger schools seem to have the most trouble in this respect, namely group "A".

In the final item 28 - the facilities for seating players of both squads so they will not be crowded by spectators - failed to pass in 11 of the schools visited. As the hazard reads, a great many awkward situations might arise from the placement of players as noted above. 24 schools had sufficient room for seating the players, so that they were in no way in contact with the spectators. The breakdown into groups was "A" - 6, "B" - 3 and "C" - 2. Once again the larger schools are the most frequent offenders, or group "A".

Key for Chart in Analysis of Data

Column No. 1	Hazard Items
Column No. 2	Passable or better
Column No. 3	Not passable

COMPLETE BREAKDOWN OF ANALYSIS OF DATA FOR THIS SURVEY

1	2	3
(1) Storage recesses provided for pianos and phonographs. . .	25	10
(2) Doors to storage spaces flush with walls.	23	12
(3) Lights recessed in the ceiling and proper lighting. . . .	12	23
(4) All glass entrance doors - safety glass.	24	11
(5) Doors open away from playing space to avoid possibility of players colliding with them.	33	2
(6) Drinking fountains, radiators, mat hangers and door knobs recessed and properly padded.	27	8
(7) Walls covers rounded, if possible, or padded.	26	9
(8) Goals near end wall or bleachers - padded.	29	6
(9) Windows screened to protect players and windows.	34	1
(10) Shades provided for windows, where sun's glare is likely to blind players.	26	9
(11) Gymnasiums so constructed, as to remove hazards, pillars or obstructions projecting over the playing surface. . .	26	9
(12) Sufficient area for the peak loads to prevent overcrowding and pushing.	14	21
(13) Gymnasium overloaded with spectators.	16	19
(14) Clearance of areas adjacent to the side and end lines of the basketball courts.	21	14
(15) Floor surface even but not slippery.	28	7
(16) Knee pads and elbow pads and unbreakable lens glasses for protection.	11	24
(17) Sneakers or other faulty equipment that will cause hazards to the players.	14	21
(18) Size of gymnasium in regard to regulation.	21	14
(19) Equipment too close to playing surface.	21	14
(20) Stands on edge of outside lines under the basket and end walls, placed far enough back to give players protection.	20	15
(21) Stands - safe for spectators.	35	0

Key for Chart

Column No. 1	Hazard Items
Column No. 2	Passable or better
Column No. 3	Not passable

COMPLETE BREAKDOWN OF ANALYSIS OF DATA FOR THIS SURVEY (CONTINUED)

1	2	3
(22) Windows - arranged for proper ventilation.	27	8
(23) Proper officiating to handle game.	35	0
(24) Adequate police protection.	34	1
(25) Firelaws in effect.	35	0
(26) Obstructions - hanging ropes, bars, beams, pipes, low ceilings, ladders, etc.	27	8
(27) Safe place for timer's and scorer's table, so they will not be bothered by spectators.	26	9
(28) Facilities for seating players of both squads, so they will not be crowded by spectators.	24	11

Key for Chart

Column No. 1 Hazard Items
Column No. 2 Passable or better
Column No. 3 Not passable

CHAPTER VI

SUMMARY AND CONCLUSIONS

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

In regard to the entire breakdown of the overall picture, out of a possible 980 items to be checked, 286 did not measure up to the passing standards. This rather revealing figure shows the need for remedial work to be done among the educators themselves. To further break them down into groups, we are left with 107 in "A", 73 in "B", and 106 in "C". This amazing analysis, as summed up by the author, shows that the large and small schools are about equal offenders, where as the medium size school group is considerably lesser in their number of hazards.

Conclusions

The following conclusions were made from an analysis of the data:

(1) That the present gymnasium hazards be as completely eliminated as possible by the individual schools.

(2) That an ideal situation be set up and used for the basis of new construction.

(3) That basketball coaches and physical education men be included on all committees of survey for new construction, and that their opinions be adhered to.

(4) That schools involved in overloading be required to limit their sale of tickets to cover the maximum allowable crowd.

(5) That a system of checks be set up by a responsible group, such as the Headmasters Association; and they be empowered to regulate the safety procedures adaptable to each individual basketball court and it be enforced.

CHAPTER VII

RECOMMENDATIONS

CHAPTER VII

RECOMMENDATIONS

The results of this survey shows many weaknesses in the setups of the gymnasiums used. First, the writer would like to say that the schools used represent a good comparison of the type in the entire area. By taking a good cross section of all school sizes, it would seem that the following recommendations could be used by all communities in considering construction.

The following are the recommendations drawn from this study: -

(1) Better storage facilities for equipment, etc.

(2) A better lighting system installed in many schools.

(3) The glass in doors be changed to safety glass where not such.

(4) All drinking fountains, radiators, mat hangers, door knobs, and other pointed obstructions recessed.

(5) Goals should not be too close to walls.

(6) Shades should be provided for all windows where glare is possible.

(7) Gymnasiums should be constructed as to remove pillars or obstructions projecting over the playing surface.

(8) Sufficient area should be allowed for peak crowds during games.

(9) Limited sale of tickets should be instituted at some gymnasiums.

(10) Sufficient clearance allowed adjacent to the side and end lines of courts should be provided.

(11) Knee pads, elbow pads, should always be available.

(12) All floors should be constantly checked for slipperiness and eveness.

(13) Schools, if possible, should either supply or be sure that sneakers worn, are in the best possible condition.

(14) When constructing, the size of gymnasiums should be regulation.

(15) When folding stands used, be sure enough clearance is allowed for players protection.

(16) All windows should be arranged for proper ventilation.

(17) Be sure hanging ropes, low ceilings, bars, beams, pipes, ladders, etc. are eliminated.

(18) A safe place for the timer's and scorer's table should be provided.

(19) Facilities for seating players of both squads, so they will be away from spectators.

Use of Recommendations

The above recommendations show the common failings throughout the area studied. Each school should attempt to correct their own, as far as possible.

The real accomplishment of this study can be transformed into all new construction. By following the list of hazards used and eliminating any that might appear, any group or committee in considering a new gymnasium will be able to stay away from the more common hazards found.

Of course, the matter of population, valuation and ability to pay will enter into construction of the building, but it would seem that a little more money spent now for protection, is a worthwhile investment for the future.

An administrator with tact in public relations, might convey the results of this survey to Parent Teacher Associations and School Planning Committees, to emphasize need for improvement in their particular town.

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APPENDIX

CHECK LIST USED BY AUTHOR WHILE VIEWING CONTESTS

(1) Storage recesses provided for pianos and phonographs. . .

(2) Doors to storage spaces flush with walls. . . . .

(3) Lights recessed in the ceiling and proper lighting. . . .

(4) All glass entrance doors - safety glass. . . . .

(5) Doors open away from playing space to avoid possibility of players colliding with them. . . . .

(6) Drinking fountains, radiators, mat hangers and door knobs recessed and properly padded. . . . .

(7) Wall covers rounded, if possible, or padded. . . . . . .

(8) Goals near end wall or bleachers - padded. . . . .

(9) Windows screened to protect players and windows. . . . . .

(10) Shades provided for windows, where sun's glare is likely to blind players. . . . .

(11) Gymnasiums so constructed, as to remove hazards, pillars or obstructions projecting over the playing surface. . . .

(12) Sufficient area for the peak loads to prevent overcrowding and pushing. . . . .

(13) Gymnasium overloaded with spectators. . . . .

(14) Clearance of areas adjacent to the side and end lines of the basketball courts. . . . .

(15) Floor surface even but not slippery. . . . .

(16) Knee pads and Elbow pads and unbreakable lens glasses for protection. . . . .

(17) Sneakers or other faulty equipment that will cause hazards to the players. . . . .

(18) Size of gymnasium in regard to regulation. . . . .

(19) Equipment too close to playing surface. . . . .

(20) Stands on edge of outside lines under the basket and end walls, placed far enough back to give players protection. . . . .

(21) Stands - safe for spectators. . . . .

(22) Windows - arranged for proper ventilation. . . . .

(23) Proper officiating to handle game. . . . .

(24) Adequate Police Protection. . . . .

(25) Firelaws in effect. . . . .

(26) Obstructions - hanging ropes, bars, beams, pipes, low ceilings, ladders, etc. . . . .

(27) Safe place for timer's and scorer's table, so they will not be bothered by spectators. . . . .

(28) Facilities for seating players of both squads, so they will not be crowded by spectators. . . . .