

1 AHP method for selecting the best strategy to Enhance Safety Culture
2 A Case study at “XYZ” Company in Qatar
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5

6 **ABSTRACT**
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8 Lack of safety culture awareness in the ambulance services affects not only locally but
9 internationally in different countries, including at "XYZ" a company in Qatar. Many
10 studies mentioned about risks and hazards associated with ambulance services that result
11 from illnesses, accidents, or property damaged because of a lack of safety culture. The
12 results of the safety culture survey were showing less of commitment and involvement of
13 ambulance personnel to safety 52.6% and less motivation 57.9%. It supports by the
14 achievement of key performance index of ambulance services that was 85 % – 96 %
15 from the target. This paper discussed a strategy to improve safety culture in ambulance
16 services. The authors conducted a research study utilizing the AHP method to select the
17 best approach by following the real condition. This study compares the essential factors
18 in improving safety culture based on eight criteria and three strategies safety climate
19 which the result shows that (a) The commitment of senior management with a value of
20 0.247 or (247%), and (b) Operational approach strategy with a value of 0.386 or (38.6%),
21 with CR of 0.03 are among the top priorities needed in the operational of ambulance
22 services to run optimally.
23

24 **Keywords:** *Safety Culture, Ambulance Service, AHP*
25

26 **Introduction**

27 Indicators of a good safety culture in an organization can result from various factors like
28 as good safety commitment from top management and employees, compliance with
29 policies and regulations, quality services and professionalism or the existence of a safety
30 system in the organization [ref](#). However, most of the people will see from the number of
31 accidents and illnesses that occur in the organization [ref](#). This perception applies equally
32 to all organizations or agencies, including ambulance services [ref](#).

33 Ambulance service is one of the core businesses in health services in the modern era.
34 Safety concerns in ambulance services are mandatory while delivering services. Failure
35 to provide optimal services and develop an ambulance safety culture, it will lead to risks,
36 hazard, and accident to ambulance personnel and patients.

37 Several factors are causing failure to provide high quality and excellent safety
38 performance in ambulance services such as physical and psychological condition,
39 professionalism, motivation and competence, work environment, weather, coworkers,
40 policy and finance problem. Pattersen, Weaver, & Hostler, D., (2015) states, in addition
41 to physical risks, EMS personnel also experience psychological risks. Many EMS
42 personnel violate in written regulations, failed on procedures, stress, felt insomnia and
43 exhausted and have no commitment to the profession [ref](#). Uncontrolled and
44 unpredictable environmental conditions, lack of supervision, limited information and
45 uncertainties that often linked as factors that contribute to increased safety risks for
46 patients in EMS services (Price, Bendall, Patterson, & Middleton. 2013).

47 Due to lack of the safety culture in ambulance service, it will leads high risk incident and
48 accident that it will be harmful to ambulance personal and patient [ref](#). Generally, there
49 are two main risks and hazards of working in an ambulance [ref](#). There are work-related
50 illnesses and work-related accidents. Based on data from the NHTSA agency period of
51 1999-2011, the number of accidents or collisions related to ambulance every year is
52 around 4500 cases. 34% resulted in injuries and 33 people died [ref](#). From the data that
53 died, 4% were ambulance drivers, 21% were ambulance passengers, 63% were
54 passengers from other vehicles and 12% were pedestrians (NHTSA, 2012).

55 Researched by Yilmaz, Serinken, Dal, Yaylaci, & Serpil, (2016) in Western Turkey,
56 regarding personnel ambulance accident, described: "The most accident happens in
57 ambulance service was motor vehicle accident (MVA). It is around 31.9% from a total of
58 163 personnel injured, needle-stick injuries (16.0%) [ref](#). Needle-stick injuries usually
59 occurred during intravenous line procedures (59.4%) and inside the cruising ambulance
60 (n=20; 62.5%). Working inside the ambulance was the most commonly accused cause of
61 the work-related injury-WRI (41.3%). Lin, (2018) supported it in Taiwan; Among the
62 1,627,217 traffic accidents during the study period, 715 ATA's caused eight deaths
63 within 24 hours and 1844 injured patients. On average, there was one ambulance traffic
64 accident-ATA for every 8598 ambulance runs [ref](#). Compared to overall traffic accidents,
65 ATA's were 1.7 times more likely to result in death and 1.9 times more likely to have
66 injured patients [ref](#). Amid 715 ATA's, 8 (1.1%) ATAs were fatal, and 707 (98.9%) were
67 nonfatal" [ref](#).

68
69 Similarly, it also happened in the ambulance service at XYZ Company. In the 2013-2018
70 period, there were 4833 emergency calls [ref](#). Two thousand six hundred fifty-six calls
71 (55.5%) were related to patient management, and 45 % non-related. One hundred
72 seventeen cases (4.4%) were traffic accidents, 424 (16.0%) cases of trauma or injury,
73 2098 cases (79.0%) were medical, and 17 cases (0.6%) were dead on arrival [ref](#).
74 Whereas, accidents related to ambulances or involving ambulance personnel not
75 appropriately recorded [ref](#). There were 5 cases of crashes involving ambulances, no
76 casualty but caused ambulance damaged was high costs repaired [ref](#).
77 Based on data from occupational health (OH) clinic period of 2016 - 2018, there were 3
78 cases of ambulance personnel suffered low back pain and spinal cord injury due to faulty
79 in lifting, 1 case of small head injury and 1 case of heat exhaustion [ref](#). Number of sick
80 leave during 2017 was high. OH recorded, 1.55% (544 days) of health workers including
81 ambulance personnel submitted sick letters [ref](#).

82
83 On annual report 2018 of safety performance reported, participate of providing incident
84 or accident says in the health department of XYZ Company, especially ambulance
85 services, was deficient [ref](#). It was 16 reports during the 2013-2018 period [ref](#). 90% are
86 related to patient management, and 10% similar to safety events; unexpected events
87 (KTD) and near misses (KNC) [ref](#).

88 The National Patient Safety Agency, (2011) in Wankhade & Jones, (2015) mentions
89 complex problems in the provision of ambulance services and related processes, as risk
90 factors for quality service failures. The risk and hazard in ambulance service are difficult
91 to avoid because of the environment condition and the nature of work itself, but it can be
92 reduced or minimized as little as possible by efforts to enhance occupational health and
93 safety system with increasing promoting strategy through the development of a safety
94 culture in the work environment.

95 Based on the description above, the author is interested in researching the strategy to
96 enhance safety culture at the ambulance service of the XYZ Company in Qatar. The

97 primary purpose of this research is to analyze existing problems, formulate priority
98 strategies and build up a model for strengthening the safety culture in ambulance services
99 at XYZ Company. Building a safety culture in ambulance services or organizations is
100 fundamental. A positive safety culture influenced by organizational performance and
101 safety management performance.

102

103 **Literature Review**

104

105 In the United States of America or most Europe countries, ambulance services were
106 called Emergency Medical Services (EMS) [ref.](#) EMS is an ambulance service system in
107 terms of emergency services integrated in terms of facilities, professional personnel and
108 management systems that are standardized both nationally and internationally (Platt,
109 Stoy, & Lejeune, 2011). Principally, EMS practitioners have some responsibility as well
110 as another health practitioner in the hospital to provide established high-quality health
111 services to the patient [ref.](#) EMS practitioners more focus on pre-hospital management
112 before the patient sends to the hospital [ref.](#) As per the purposes, EMS practitioners have
113 proper education, high skill, and good mentality when delivery the services and good
114 adapting with situations and conditions in the scene [ref.](#)

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116 To maintain and improve the care of patients, systematic documentation and periodic
117 audits, or other processes to ensure the quality of care, need to be incorporated [ref.](#)
118 "Quality management systems that are simple, are continuous, and allow for rapid
119 changes in the system need to be implemented" (Jones, 2015) in (Wankhade & Jones,
120 2015). The safety and quality management in the ambulance became a priority and
121 essential because a lack of supervision in safety will be lead to an accident, loss of
122 property damage, social problem and protection for the personnel and patient [ref.](#) The
123 Berwick Report (DH 2013) in Pattersen, Weaver, & Hostler, (2015) explained, what
124 steps to be required to improve patient safety: "Identifying that incorrect organizational
125 priority, systems, environmental factors, and culture were contributory factors in failing
126 to learn and in failing to protect patients from harm". It is meaning, and we should
127 eliminate the risk factors and enhancing the safety culture in the ambulance to maintain
128 the services and protect all parties involved in ambulance services, including personnel
129 and patient [ref.](#)

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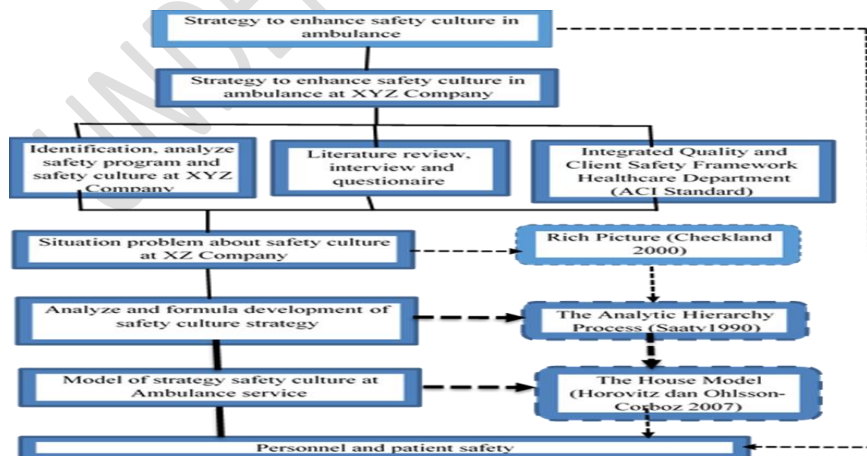
131 What is the safety culture means and how's to enhance safety culture? Confederation of
132 British Industry (CBI, 1991) defines "culture" is the way we do things around here".
133 Stranks, (2007) described as "a state of manners, taste and intellectual development of
134 mind, tastes, etc. by education and training." The Department of Mine, Industry
135 Regulation and Safety of Western Australia defined "the safety and health culture of an
136 organization is a reflection of the values, attitudes, perceptions, competencies, and
137 behaviors of the people working there (WHSQ, 2013). It reflects the organization's
138 commitment to, and prioritization of, safety and health as well as the effectiveness of the
139 organization's safety management system [ref.](#) The elements of a safety and health culture
140 organized into three categories: a)- Organizational. It includes policies, procedures, and
141 systems that relate to safety and health. b)- Psychological, involving individual
142 perceptions, attitudes, and values. c)- Behavioral, what people do, health, and safety
143 behaviors [ref.](#) King (2013) Identified two distinct while developing a safety culture
144 within the organization: a)- A transformation of systems, leadership, and organizational
145 culture. b)- The administration created the conditions in which high standards of care are
146 delivered consistently, setting clear goals and standards for improving quality and patient
147 safety, and providing the tools for staff to address these goals within available resources.

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149 In building a safety management system in adhering to a high quality in the ambulance
 150 service based on the enhancement of safety culture within the organization, there is some
 151 indicator that needs to follow. The cultural symbols utilized in many aspects of activities
 152 found within the organizations [ref.](#) It is how to measures specific features of a particular
 153 culture of the people or group of the people when they are doing communication,
 154 transaction, or other business [ref.](#) (Stranks, 2007) On human factors and behavior, safety
 155 said: "cultural indicators linked with Key Performance Indicators (KPI) and Success
 156 Criteria (Acceptance Criteria)." Within an organization, cultural indicators include a)
 157 Degree of loyalty and commitment displayed by all levels of the workforce. b) Presence
 158 of shared goals with specific signs. c). Policies and procedures. d) Evidence of fair and
 159 effective management systems. e) Investment in people (Training, frequent information)
 160 f) Investment in Technology. g) Compliance with a legal requirement. Personal
 161 integrity at all levels. h) System for communication both within and in our organization.
 162 i) A well-written mission statement. And j) A publicized reward structure that rewards
 163 high levels of performance. The organization operational and safety performance will
 164 influence those indicators. The indicator shows, the critical thing of build up a system
 165 and human resources as well to get a positive culture in the workplace [ref.](#) In the
 166 meantime, in the context of ambulance operational, the commitment from executive or
 167 top management are very significant because it is related to vision and mission, value,
 168 financing, and build up a system [ref.](#) [Figure 1.1 below is a theoretical framework of the](#)
 169 [strategy to enhance safety culture at the ambulance service of XYZ Company.](#)

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175 **Methods**

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177 This type of research is conceptual research, which is research related to an idea or
 178 theory that might be applied, with a system approach. The theoretical research that [the](#)
 179 [researcher](#) did was a concept, design, or strategy to improve safety culture at the
 180 ambulance service of XYZ Company in Qatar. The study conducted from March 2019-
 181 up to July 2019 at XYZ Company.

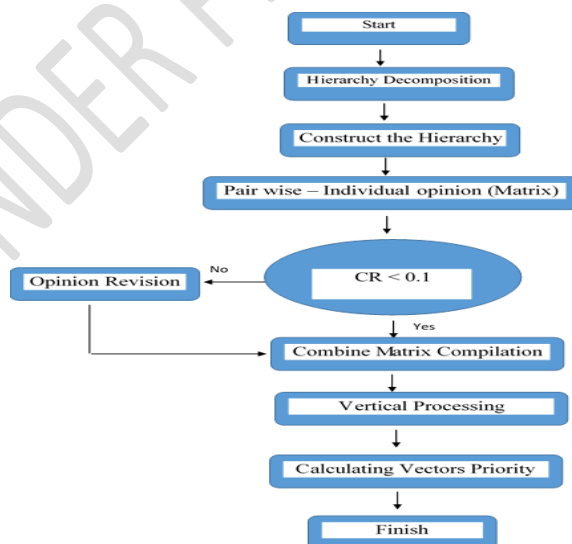


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Figure 1.1: Theoretical framework of strategy to enhance safety culture at ambulance service in XYZ Company Qatar

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187 Descriptive analysis is used to analyze data by describing the data collected without the
188 intention to create a generally applicable conclusion — the systematical data found by
189 interview results, observation, documentation, and survey. Descriptive analysis was used
190 to describe problems, risk factors regarding safety culture at ambulance services of XYZ
191 Company. After the study results well explained, the problematic situation described
192 with Rich Picture.
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194 In this research, the author compiles primary and secondary data. Primary data collected
195 with the observation method, in-depth interview with the expert, who directly concerns
196 in enhance of safety culture in the ambulance services. In this research, choosing the
197 experts are used non-probability method and to collect data are used purposive sampling
198 technique. The primary data is used to obtain the information, assessment quality,
199 objective, and measurement of formulation strategies for enhancing safety in the
200 ambulance services of XYZ Company. The rest, secondary data taken from internal data
201 of XYZ Company, statistic, and yearly report, books, relevant websites, thesis, and the
202 related journals.
203

204 Data analysis methods used in this research are descriptive analysis, utilization of
205 questionnaire safety culture as tools analysis with SPSS25, Soft System Methodology
206 based Rich Picture (Checkland, 1999), AHP (Saaty & Vargas, 2012) in (Kholil, 2018),
207 and The House Model (Horovitz & Ohlson, 2007). By using AHP, the best choice
208 according to the objective condition determined (Kholil, Susanti, & Soechayadi, 2016).
209 The judgment from experts ~~will be were~~ analyzed and arranged appropriately by Expert
210 Choice 2.0 software (Expert Choice, 2004) and presented with the house model. In this
211 research, five experts ~~are were~~ involved. The expert for this research ~~is are~~ two
212 ambulance practitioners at XYZ Company, one direct supervisor from management, one
213 from business, health and quality section (BHQ) as an auditor and one academician
214 including practicing in occupational and health and safety. The AHP process seen in
215 Figure 1.2.
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Figure 1.2: AHP Process

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Results and Discussion

Brief view of OH&S program and safety culture at ambulance service in XYZ Company Qatar

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The XYZ Company is engaged in oil and gas. As a state-owned company with international tenure, the viability of a safety management system in the company mandates and must be in operation [ref.](#) One standard that must be met by the company is to provide a plan and emergency response system to deal with emergency conditions and situations [ref.](#) Ambulance service is one component in the emergency response system [ref.](#) The ambulance service at XYZ Company operates 24 hours, 7/28 with a fleet of 4 units with a total of 39 personnel from several different countries. Operationally, the ambulance service provides emergency services for all employees in the industrial area, neither for XYZ employees itself nor contractors and subcontractors.

Officially, the company have been received ISO 9001-2015 and ACI "Diamond" Level (Accreditation Canada International) for Quality services, but not yet synchronized with implementation at ambulance services.

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Table 1.1: ACI – Accreditation Canadian International Program.

Category	Goal
Safety Culture	Building a culture of safety in the company
Communication	Improve communication and coordination in services and service providers and service recipients
Medicines Dispensing	Make sure you use drugs at risk
Work Environment	Establish a safe place and work environment in providing services
Infection Control	Decreases and minimizes the risk of disease due to service to service personnel
Risk Analysis	Identify risks to clients and employees

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Source: ACI manual book 2018 XYZ Company

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Management's commitment to safety seen in the form of the BHQ division (Business, Healthcare, and Quality). "The BHQ team is responsible for the direction and implementation of the management functions of compliance with procedures, service quality, health risks in the work environment of the company clinic and ambulance". The focus and responsibilities are "on improving quality, effective health risk management and compliance with national health regulations to improve the health values of XYZ companies and employees following health terms and standards, good service and cost-effectiveness."

OH&S's Company strategies and objectives are as follows:

- a. Improve the performance of the health system and service delivery (ensuring the reach of health services that are accessible and sustainable according to the needs of XYZ company employees and work partners and other stakeholders).
- b. Safety, quality and client satisfaction (providing integrated, safe, high-quality health services to improve the physical and mental health and well-being of clients).

- 277 c. Occupational health services and collaborative support (providing world-class
 278 occupational health services for XYZ company employees and collaborative support
 279 to internal and external stakeholders.)
 280 d. Professional development (ensuring and maintaining a competent workforce through
 281 the development of sustainable professionalism).
 282 e. Efficient business processes and financial systems with integrity (ensuring financial
 283 integrity through the implementation of efficient business processes).

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 286 **Data Findings and Analysis**

287 *Analysis or description of the problem situation in the XYZ company ambulance*
 288 *service.*

289
 290 In general, the Safety system and program in the XYZ Company are excellent, but the
 291 implementation in the field still needs to be improved. Based on the result of the safety
 292 culture survey, it showed in table 1.2:

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 294 Table 1.2: Descriptive Analysis Result
 295 Safety culture at Ambulance Services in XYZ Company Qatar
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Criteria	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	
				Lower	Upper
Management Commitment	9.4474	1.13179	.18360	9.0754	9.8194
Communication	9.0526	1.48774	.24134	8.5636	9.5416
Employee Involvement	8.5000	1.42847	.23173	8.0305	8.9695
Training & Information	9.3947	1.15172	.18683	9.0162	9.7733
Motivation	8.3158	1.71015	.27742	7.7537	8.8779
Comply with Policy & Procedure	8.8947	1.87140	.30358	8.2796	9.5099
Learning Organization	9.2105	1.29777	.21053	8.7840	9.6371

297 Resource: Extracted from SPSS25.

298
 299 Based on table 1.2 above, the highest value is a management commitment criterion with
 300 an average score of 9.44 while the lowest cost is a motivation criterion with an average
 301 rating of 8.31.

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 304 Table 1.3: Frequency Analysis Result
 305 Safety culture at Ambulance Services in XYZ Company Qatar
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Criteria	Value	Frequency	Percent	Valid Percent	Cumulative Percent
Management Commitment	No	11	28.9	28.9	28.9
	Yes	27	71.1	71.1	100.0
Communication	No	15	39.5	39.5	39.5
	Yes	23	60.5	60.5	100.0
Employee	No	18	47.4	47.4	47.4

Involvement	Yes	20	52.6	52.6	100.0
Training & Information	No	11	28.9	28.9	28.9
	Yes	27	71.1	71.1	100.0
Motivation	No	16	42.1	42.1	42.1
	Yes	22	57.9	57.9	100.0
Comply with Policy & Procedure	No	10	26.3	26.3	26.3
	Yes	28	73.7	73.7	100.0
Learning Organization	No	14	36.8	36.8	36.8
	Yes	24	63.2	63.2	100.0

307 Resource: Extracted from SPSS25.

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309

310 Based on the table 1.3 above, comply with policy and procedure have the highest rating
311 with a value of 73.7%, while employee involvement was the lowest value with a value of
312 52.6%.

313

314 This is supported by internal data which is the key to the work performance of the
315 ambulance unit (KPI). In this case, it can be seen with unsatisfactory achievements from
316 the patient handling report of 94% during 2018. Even though reporting on services to
317 patients is fundamental as the legality of all actions that have been done. Likewise, the
318 value of the reporting index of pain scale and response time were 96%.

319

320 **Rich Picture (RP)**

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322 In this stage, identify the problem as a problematic situation known from the culture of
323 the safety of ambulance services at the XYZ Company. Problematic situations aim to
324 explain clearly about issues in the real world. The process at this stage is essential
325 because it is related to the decisions of experts. After the results of the analysis
326 concluded, the next process illustrated by drawing for explaining the situation in the real
327 world. See, Figure 1.3 as below:

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Formulation of Safety Culture Improvement Strategies at Ambulance Services at Qatar XYZ Company.

According to Expert's judgment towards 8 criteria's and 3 strategies proposed in the effort to enhance safety culture at ambulance service in XYZ company, there were 3 main factors that get individual attention, namely: commitment of senior management is the most critical factor with a value of 0.247 (24.7%), followed by employee commitment and involvement with a value of 0.181 (18.8%) and compliance with regulations and existing procedures with a value of 0.140 (14%). The Expert's argued: "Commitments with a clear vision and mission from management and a good system improvement on OH&S will spur organizations and employees to always comply with OH&S." The synthesized result is seen in Figure 1.4.

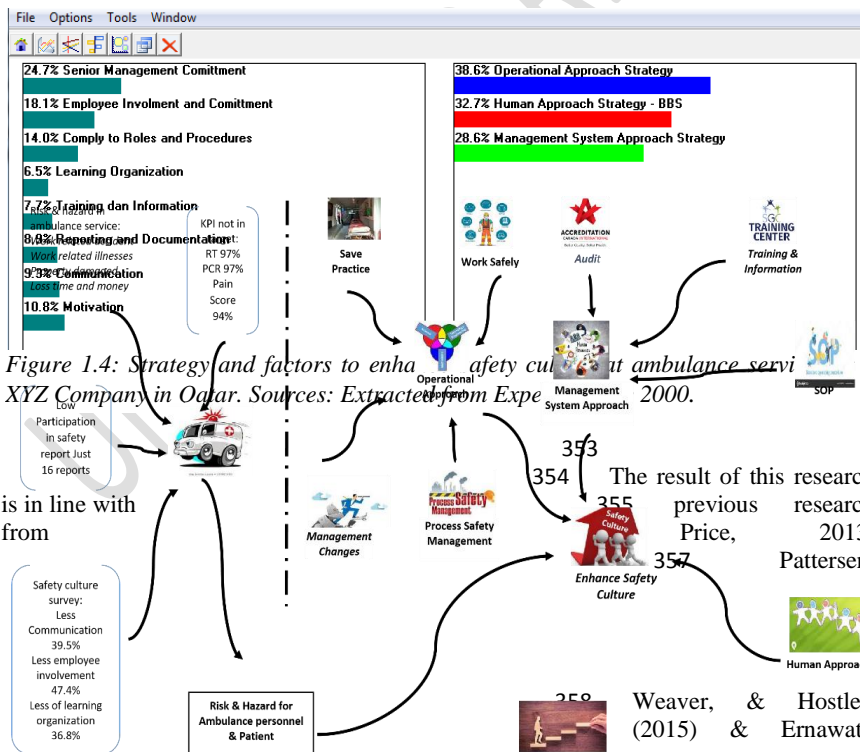


Figure 1.4: Strategy and factors to enhance safety culture at ambulance service XYZ Company in Qatar. Sources: Extracted from Expert's judgment (2000).

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is in line with from

Safety culture survey:
Less Communication 39.5%
Less employee involvement 47.4%
Less of learning organization 36.8%

Risk & Hazard for Ambulance personnel & Patient

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The result of this research previous research Price, 2013; Pattersen, Weaver, & Hostler. (2015) & Ernawati,

Figure 1.3: Rich Picture of Situation Problem at Ambulance service of XYZ Company

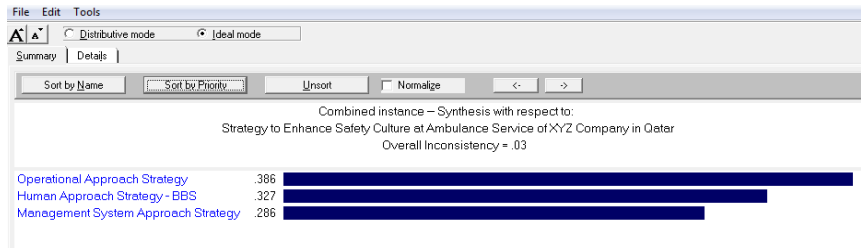


Figure 1.5: Priority of Safety Culture Improvement strategies in ambulance services at Qatar XYZ Company. Source: Extract from Expert Choice 2000

360 Arini, & Haryono, (2017). They mentioned, “The risk factors that causing various
 361 hazards in the ambulance service environment, it came both internally and externally
 362 such as destitute of the systems, no organizational commitment, lousy culture,
 363 inadequate safety facilities and infrastructure. It is also because of procedures that do not
 364 meet standards, stress, lack of knowledge, training and motivation, conditions of work
 365 and weather climate”. This study supported by Atack & Maher, (2010) on Perception of
 366 EMS personnel and health workers on safety issues in the pre-hospital service, they
 367 suggested, more active participation of EMS personnel to improve skills, clinical
 368 decision making and the necessity for changes in the regulations and health systems in
 369 the regions and the government, in the effort to enhance the safety of the patient.

370
 371 Anyhow, the essential strategy based on the expert's judgment was operational approach
 372 strategy with a value of 0.386 (38.6%). The following strategy was the human approach.
 373 In this approach strategy, the expert binds the second priority with a value of 0.327
 374 (32.7%). While the latter approach is a management system approach with a value of
 375 0.286 (28.6%). Overall this assessment has a level of inconsistency or CR 0.03 so that
 376 the opinions of experts can be accepted. See, Figure 1.5

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 378 Based on the expert's judgment, who was prioritizing operational strategies was the most
 379 important with a value of 0.386 (38.6%) is very appropriate. It is because of the XYZ
 380 Company already has an excellent safety management system, but the implementation in
 381 the field still needs to be improved. In this case, it was evident from the KPI index that
 382 does not meet the target and safety culture results. The determination of safety values is
 383 not limited to paper, but it needs explicit work. For this reason, a strategy for improving
 384 safety culture with operational approaches can be carried out in the following ways
 385 (Ramli, 2013):

- 386 a. How to work safely.
- 387 b. Management changes
- 388 c. Safe operation
- 389 d. Process safety management

390
 391 The second strategy should be developed is a humans approach strategy with a priority
 392 value of 0.327 (32.7%). The approach to insane, or better known as behavior-based
 393 safety (BBS), is a fundamental alternative strategy. This strategy requires hard work to
 394 run it. Behavior change cannot be done in a short time but requires clear steps and
 395 programs with the support of top management. They argue that; "Safety culture will run
 396 effectively and successfully if there is motivation and have positive attitudes and
 397 behaviors, so they will tend to do positive things too." Thus, all existing regulations and
 398 systems will be easy to run.

399

400 The last strategy is the approach strategy of the system with a value of 0.286 (28.6%). In
401 this approach focuses on building an OH&S management system within the organization
402 to improve the program and safety culture. Reasonable policies and procedures support
403 the success of safety in the operation of ambulances or other activities — this approach
404 made by creating a system of documentation, control of documents, and data. At the
405 same time, building work plans in ambulances, targets, and excellent communication
406 between personnel. The Expert's mentioned: "*A safe way of working by analyzing the
407 surrounding risks and following the procedures in the ambulance service, will provide a
408 sense of security in working.*"

409 Studied by Jones (2005) in Wankhade & Jones, (2015) states, "Quality management
410 systems that are simple, are continuous, and allow for rapid changes in the system need
411 to be implemented". To maintain and improve service, systematic documentation,
412 routine training, and continuous audits need to be promoted. It is

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417 also supported by Pirrallo, Khan, & Kuhn, (2005) "The development of policies and
418 protocols related to operational safety directly impacts the safety of the patient". ". Those
419 all the steps will improve the system and quality management in the operation of the
420 ambulance.

421 According to Wankhade & Jones, (2015) in ethnographic studies in the UK about
422 cultural elements in ambulances, identifying three different occupational subcultures
423 using the Schein (1996) typology: Elements of safety and health culture can be organized
424 into three categories: a). Organization. This includes policies, procedures, and systems
425 related to safety, and health. b). Psychological, which involves individual perceptions,
426 attitudes and values. c). Behavior, people's behavior, health, and safety behavior.

427
428 Meanwhile, in the context of ambulance operations, commitment from executives or top
429 management is very significant because it is related to the vision and mission, values,
430 financing, and system building. If you do not have a clear commitment, the results will
431 not be achieved. So with this, expert judgment can be summed up simply in an AHP
432 hierarchy like figure 1.6 and in house model like figure 1.7.

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Figure 1.6: AHP Hierarchy Results of Strategy to Enhance Safety Culture at Ambulance Service of XYZ Company in Qatar.

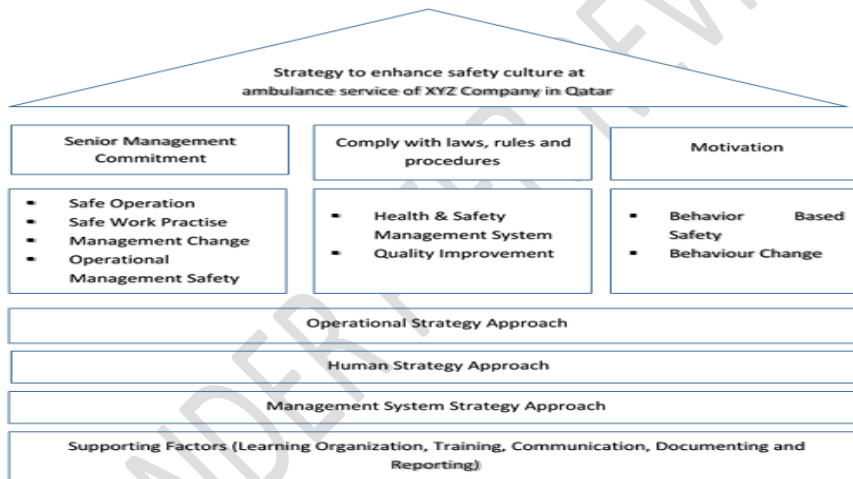


Figure 1.7: The House Model of Strategy to Enhance Safety Culture at Ambulance Service of XYZ Company in Qatar

436 | **Conclusion**

437 Provide a high quality of ambulance services with the medical organization, and the
438 safety aspect is one most crucial component while delivering care. Enhancing safety
439 culture within an organization is one program to improve safety performance. According
440 to the expert's judgement and AHP Synthesized, Commitment from senior management
441 was the vital thing factor with a value of 0.247 (24.7%), following by employee
442 commitment and involvement with a value of 0.181 (18.8%), compliance with existing
443 regulations and procedures with a value of 0.140 (14%) and motivation 0.108 (10.8%).
444 Those are essential factors in efforts to improve safety culture in ambulance services.
445 The operational approach is an alternative development strategy with an analysis of the
446 value of 0.386 (38.6%). These factors and strategies will have an impact on the
447 development and improvement of safety culture in ambulance services at the XYZ
448 Company with the ultimate goal of fulfilling safety protection for personnel and patient.

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449 The House Model method is a model or presentation of a strategy to improve safety
450 culture in the ambulance service with a mission on the safety of ambulance personnel
451 and patient. The three main factors become pillars in building a strategy to improve
452 safety culture in ambulance services, namely commitment from management and
453 employees, compliance with regulations and motivation. These pillars upheld through
454 operational approach safety programs through safe work, changes to management by
455 making regulations and work standards, synergized with approaches to employees by
456 changing behavior and perceptions and providing motivation with the support of a sound
457 system approach about safety through a safety management system that continues to
458 develop with the ongoing audit.

Comment [RD2]: This is part of the results and must be moved to results

459

460 **COMPETING INTERESTS DISCLAIMER:**

461 **Authors have declared that no competing interests exist. The products**
462 **used for this research are commonly and predominantly use products in**
463 **our area of research and country. There is absolutely no conflict of interest**
464 **between the authors and producers of the products because we do not**
465 **intend to use these products as an avenue for any litigation but for the**
466 **advancement of knowledge. Also, the research was not funded by the**
467 **producing company rather it was funded by personal efforts of the**
468 **authors.**

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471 **Recommendation**

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473 Further research needs to be done in an effort to develop a safety culture in ambulance
474 services and the development of safety programs that are directly related to the safety of
475 ambulance personnel and patients in particular. The development of safety culture in
476 ambulance services will improve the quality of services that prioritizes the safety of
477 personnel and patients.

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